

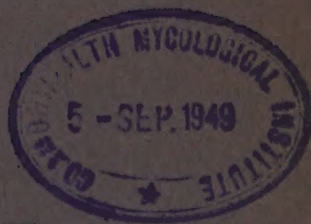
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THE VETERINARY BULLETIN

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[No. 6.]

DISEASES CAUSED BY BACTERIA AND FUNGI

I. POUNDEN, W. D., & KRAUSS, W. E. (1947.) **Staphylococcal abortion in cattle.**—*J. Amer. vet. med. Ass.* 111. 35-36.

II. POUNDEN, W. D., FERGUSON, L. C., KNOOP, C. E., & KRAUSS, W. E. (1947.) **A further report on staphylococcal abortions in a dairy herd.**—*Ibid.* 376-377. 1140

I. & II. An account is given of observations on five abortions in a herd of 50 Holstein-Friesian cows. *Staph. albus* was recovered from the uterine exudate of four of the cows and from two of the aborted foetuses. Examinations for *Vibrio foetus*, *Trichomonas foetus* and *Brucella abortus* were negative. In all cases the normal uterine fluids were replaced by a quantity of grayish tan coloured pus and there was necrosis of the cotyledons.

All the cows were pregnant as a result of artificial insemination with semen from the same sire. Cultural examination showed the presence of *Staph. albus* in the semen of this bull.

It is suggested that the practice of passing the inseminator anterior to the cervix enables pathogenic bacteria, which would be killed by the secretions of the cervix in normal service, to gain access to the uterine mucosa.—A. FOGGIE.

MCDIARMID, A. (1946.) **Studies on enzootic staphylococcal infection in lambs associated with tick-bite. III. Pathogenicity of the causal organism in the guinea-pig.**—*Vet. Rec.* 58. 431-432. [For previous parts, see *V. B.* 17. 63, and 18. 1.] 1141

The results of the inoculation of g. pigs, with a strain of staphylococci isolated from a case of tick pyaemia, are recorded.

By the subcutaneous route local abscesses only were produced. Intraperitoneal inoculation failed to produce any signs of ill-health. Severe symptoms and death could be produced by the direct introduction of the organism into the blood stream by the intracardial route.

Using dilutions comparable with No. 8 on Brown's Scale, doses of over 0.05 ml. caused septicaemia and doses of 0.025 to 0.0063 ml. produced pyaemia.

Eighteen g. pigs were infected with a standard dose of staphylococci of 0.0125 ml., and groups of three were killed after one, two, four, eight and 48 hours respectively; three allowed to survive died on the fifth day. Cultures made from the blood stream and viscera showed that, up to eight hours after infection, the greater proportion of the staphylococci were located in the liver and spleen. At 48 hrs. the kidney cultures gave by far the heaviest growths. In the g. pigs which died, although the kidneys were still heavily infected, there was a reappearance of considerable numbers of staphylococci in the other viscera and in the blood-stream. This is considered to be an agonal septicaemia. From these results the author concludes that the kidneys are the principal site for the multiplication of the organisms.—A. FOGGIE.

MCDIARMID, A. (1948.) **Enzootic staphylococcal infection in young lambs associated with tick-bite.**—*Proc. R. Soc. Med.* 41. 429-430. 1142

This is a short survey of the present knowledge of tick pyaemia. No new evidence is presented. The main points on which accurate information is not yet available are (1) the mode of entry of the causal staphylococcus into the lamb's body and its establishment as a generalized infection; (2) prophylactic measures against the condition; (3) the treatment of cases.—A. F.

FOGGIE, A. (1947.) **Studies on the source of the staphylococcal infection found in tick pyaemia of lambs.**—*J. Comp. Path.* 57. 245-260. 1143

F. indicates that the tick does not act as a true vector of tick pyaemia, but that it probably acts merely as an inoculator of staphylococci which are already infecting the skin. There was no correlation between the presence or absence of infection in ewes and their lambs. Four phage types were common to 86% of the strains isolated from ewes and lambs and to 88% of the cases of tick pyaemia.—J. I. TAYLOR.

OLIN, G., & LITHANDER, A. (1948.) **Toxin-forming staphylococci, as cause of deaths on the injection of infected bacteriological preparations.**—*Acta. path. microbiol. scand.* 25. 152-

159. Discussion pp. 159-160. [In English.] 1144

During the course of the last few years three deaths have occurred in children, two of them following the intramuscular injection of measles convalescent serum and one following intracutaneous injection of tuberculin. Neither preparation contained preservatives and both were contaminated with very toxic *Staph. aureus*. In tests carried out it was shown that the most commonly used preservatives killed staphylococci in bacteriological products.—E. K.-N.

BYATT, P. H., JANN, G. J., & SALLE, A. J. (1948.) **Variation in pigment production in *Staphylococcus aureus*.**—*J. Bact.* 55. 787-792. [Authors' summary copied *verbatim*.] 1145

An extract has been prepared from *Staphylococcus aureus* 6538, a highly chromogenic organism, which has the potentiality of inducing or stimulating chromogenesis in colonies of a white strain of the same species.

The extract prepared gives negative Millon, xanthoproteic, and Benedict tests, and a slightly positive test for pentose (Bial).

The newly isolated chromogenic organisms retain the biochemical properties of the parent culture, differing only in pigment production.

The intensity of pigment production is not so great in the new strains as in the strain from which the extract was prepared nor does it seem to be lasting.

NUTINI, L. G., & LYNCH, E. M., Sr. (1947.) **Response of penicillin-resistant strains of *Staphylococcus aureus* to extracts of beef brain.**—*J. Pharmacol.* 90. 313-320. 1146

An 80% alcohol-precipitated extract of beef brain was found to exert either a prophylactic or a therapeutic effect against infections produced in mice with 24 penicillin-resistant strains of *Staph. aureus* isolated from various chronic infections in human beings. In control animals and those treated with penicillin the death rate was about 90% while in those treated with the brain extract the death rate was only about 1%.

Each strain was subcultured daily in broth for 37 and 74 days in parallel series, those of the one set containing penicillin and those of the other brain extract, a third set serving as controls.

Growth was greater in both the penicillin and the extract series than in the controls. It was found in virulence tests that when the organisms were cultured in the presence of brain extract they became avirulent in 12 hours and remained so, while the series cultured in the presence of penicillin remained virulent the whole time.

—A. A. WILSON.

EVANS, J. B. (1948.) **Studies of staphylococci**

with special reference to the coagulase-positive types.—*J. Bact.* 55. 793-800. [Author's summary copied *verbatim*.] 1147

The 19 coagulase-positive staphylococci studied comprised a rather homogenous group. They could be separated from the 66 coagulase-negative strains studied by their ability to ferment mannitol under anaerobic conditions, and their ability to grow in a synthetic medium devoid of biotin.

Among the coagulase-negative staphylococci 6 strains were found to require pantothenic acid and 2 required pyridoxine. These requirements appear to be unique among the staphylococci thus far reported.

EAGLE, H., & MUSSELMAN, A. D. (1948.) **The rate of bactericidal action of penicillin *in vitro* as a function of its concentration, and its paradoxically reduced activity at high concentrations against certain organisms.**—*J. exp. Med.* 88. 99-131. [Authors' summary copied *verbatim*.] 1148

The concentrations of penicillin G which (a) reduced the net rate of multiplication, (b) exerted a net bactericidal effect, and (c) killed the organisms at a maximal rate, have been defined for a total of 41 strains of α - and β -hemolytic streptococci, *Staphylococcus albus*, *Diplococcus pneumoniae*, and the Reiter treponoma. The concentration which killed the organisms at a maximal rate was 2 to 20 times the minimal effective level ("sensitivity" as ordinarily defined). With some organisms, even a 32,000-fold increase beyond this maximally effective level did not further increase the rate of its bactericidal effect. However, with approximately half the strains here studied (all 4 strains of group B β -hemolytic streptococci, 4 of 5 group C strains, 5 of 7 strains of *Streptococcus fecalis*, 2 of 4 other α -hemolytic streptococci, and 4 of 9 strains of staphylococci), when the concentration of penicillin was increased beyond that optimal level, the rate at which the organisms died was paradoxically reduced rather than increased, so that the maximal effect was obtained only within a relatively narrow optimal zone. There were marked differences between bacterial species, and occasionally between different strains of the same species, not only with respect to the effective concentrations of penicillin, but also with respect to the maximal rate at which they could be killed by the drug in any concentration. Although there was a rough correlation between these two factors, there were many exceptions; individual strains affected only by high concentrations of penicillin might nevertheless be killed rapidly, while strains sensitive to minute concentrations might be killed only slowly. Within the same bacterial suspension, individual organisms varied

only to a minor degree with respect to the effective concentrations of penicillin. They varied strikingly, however, in their resistance to penicillin as measured by the times required to kill varying proportions of the cells.

PRICE, W. H. (1947.) **Bacteriophage formation without bacterial growth. I. Formation of staphylococcus phage in the presence of bacteria inhibited by penicillin. II. The effect of niacin and yeast extract on phage formation and bacterial growth in the presence of penicillin. III. The effect of iodoacetate, fluoride, gramicidin and azide on the formation of bacteriophage.**—*J. Gen. Physiol.* 31. 119–126; 127–133; & 135–139. Reprinted in *Stud. Rockefeller Inst. med. Res.* 135. 309–316; 317–323; & 325–329. (1948.) 1149

I. A biochemical analysis of the conditions of bacteriophage production seems practically impossible in a system in which bacteriophage multiplication depends on the growth of the bacteria. P.'s observation that bacteriophage of *Staph. muscae* increases 100,000 times in cultures of this organism inhibited by penicillin, is therefore of great interest.

II. It was found that niacin as well as penicillin encourages bacteriophage multiplication in a medium which does not allow the bacteriophage to increase of its own accord.

III. It was found that iodoacetate, fluoride and gramicidin prevent the formation of bacteriophage.—E. KLIENEBERGER-NOBEL.

McCLURE, W. B., & MILLER, A. M. (1946.) **Identification of identical strains of staphylococci in food poisoning and other infections by bacteriophage typing.**—*Canad. med. Ass. J.* 55. 36–39. [Authors' summary copied verbatim.] 1150

Eighty-seven strains of staphylococci from various sources have been typed by Fisk's method of phage typing. In a food poisoning epidemic identical strains of staphylococcus were isolated from foods and sick patients. Staphylococci isolated at different times from the blood and spinal fluid of a patient with septicaemia and meningitis were identical.

GILSON, B. St. C., & PARKER, R. F. (1948.) **Staphylococcal penicillinase: characteristics of the enzyme and its distribution.**—*J. Bact.* 55. 801–812. [Authors' summary copied verbatim.] 1151

A method for the preparation of staphylococcal penicillinase is described that consists essentially of acetone-ether treatment of staphylococcal cells at low temperature. By controlling the duration of its action on penicillin as well as other conditions, accurate assay of staphylococcal

penicillinase is possible. A method is described that yields reproducible results.

The results of exact assay of 40 strains of *Staphylococcus* for penicillinase are presented. When a small inoculum is used for testing the sensitivity of a strain to penicillin, the sensitivity appears not to be correlated significantly with the content of penicillinase of the same strain.

WASHBURN, M. R., & NIVEN, C. F., Jr. (1948.) **Amino acid interrelationships in the nutrition of *Streptococcus bovis*.**—*J. Bact.* 55. 769–776. [Authors' summary copied verbatim.] 1152

Small amounts of isoleucine and larger amounts of leucine, threonine, and norleucine inhibit the growth of certain strains of *Streptococcus bovis* in a basal medium containing one amino acid, arginine. The inhibition produced by each of these amino acids can be reversed by the addition of small amounts of valine and larger amounts of glutamic acid, methionine, and cystine, respectively.

Equal amounts of DL-phenylalanine and L-tyrosine inhibit the growth of the organism, although they produce no effect when added singly. This inhibition can be reversed by using small amounts of tryptophan and larger amounts of glutamic acid or cystine.

A possible explanation of the inhibition produced by isoleucine, leucine, threonine, and norleucine is that they block the synthesis of valine by the organism, whereas tyrosine and phenylalanine may block the synthesis of tryptophan and thus prevent the multiplication of the organism.

FRANCIS, J., & PETERS, J. M. (1947.) **Studies on *Streptococcus agalactiae* infection. I. Infection of the chick-embryo and mouse.**—*J. Comp. Path.* 57. 144–152. 1153

Strains of *Str. agalactiae* were passaged serially through chick embryos 37 times and through mice 33 times. Passage through the embryo did not increase the virulence, but it was increased after mouse passages.

The histopathology of this infection in the chick embryo and in the mouse is compared with the condition produced by a Group A streptococcus.

A noteworthy feature was that there was no relationship between the two hosts with regard to the virulence of strains of *Str. agalactiae* and Group A streptococci.—C. D. WILSON.

SKADHAUGE, K. (1948.) **Capsular antigens in some non-haemolytic streptococci belonging to the Lancefield group D.**—*Acta path. microbiol. scand.* 25. 308–317. [In English. Author's summary copied verbatim.] 1154

The author describes 12 non-haemolytic strains of streptococci which culturally and by

precipitation reactions with a group D serum are closely related to the bacteria of the enterococcus group. Serologically these strains are characterised by possession of a capsular antigen which produces distinct capsular swelling on addition of homologous serum. The capsule can also be demonstrated by staining with concentrated fuchsin solution and simultaneous addition of homologous serum. There would thus seem to be a capsular antigen not previously described. This antigen is completely resistant even to prolonged trypsin treatment and is relatively heat-resistant. Waterbath-agglutination, using formol-killed or autoclaved cultures as antigen, gives results which seem to indicate that this capsular antigen is capable of masking the reaction of more deeply seated antigens. By means of absorption experiments it was possible in some instances to produce sera containing the antibody responsible for the capsular swelling reaction only.

MOHAN, R. N. (1945.) **Bacteriology of bovine mastitis in India with special reference to the incidence of *Streptococcus agalactiae*.**—*Indian J. Vet. Sci.* 15. 173-178. 1155

A small preliminary survey of the disease in cows and buffaloes during the period 1935-42 gave the following.

The existence of *Str. agalactiae* was verified in herds as far apart as Mukteswar and Patna, but the incidence was low. The organism was not encountered in a herd of small hill cattle in contact with the Mukteswar herd. Other streptococci were *Str. uberis*, *Str. dysgalactiae* [?] and unclassified species.

Staphylococcus aureus was very prevalent and was regarded as the commonest cause of mastitis.

Other bacteria verified were *Corynebacterium pyogenes* and haemolytic *Bact. coli*.—F. C. MINETT.

FILION, R. (1948.) **Etude anatomo-pathologique des mammites bovines. [Pathology of bovine mastitis.]**—*Canad. J. comp. Med.* 12. 301-305. [In French.] 1156

The anatomy, histology and pathology of the bovine mammary gland, the paths by which infections can occur and the general nature of mastitis are briefly discussed. No new matter is included.—P. BOULANGER.

MACDONALD, J. H. (1948.) **N.Z.V.A. Conference Paper, Canterbury, February, 1948—Penicillin treatment of mastitis by the farmer.**—*Aust. vet. J.* 24. 302-306. Discussion: pp. 306-307. 1157

Farmers were instructed in the use of penicillin infusions into quarters affected with mastitis and penicillin and equipment were made available. According to the farmers' views the practice was satisfactory chiefly because more quarters were

treated and treated much earlier than if a veterinarian's attendance was necessary.

Little bacteriological work was done and the criteria of cure comprised normal appearance of the milk and a normal udder on palpation. The discussion does not cover the desirability of the practice. A plea is made for constant supervision and instruction of farmers in the use of the drug and for encouragement of good hygiene in the milking shed.—D. C. BLOOD.

CHRISTIAN, A. B. (1948.) **Sulfamethazine in the treatment of acute and chronic mastitis.**—*J. Amer. vet. med. Ass.* 113. 258-262. 1158

Following 2-5 intramammary infusions at 12-hour intervals of 50,000 to 100,000 units of penicillin dissolved in 50 ml. sterile sodium sulfamethazine solution containing 5.0, 10.0 or 12.5 g. per quarter, 113 of 119 quarters infected with chronic mastitis became clinically and bacteriologically free. Of an additional 35 infected quarters 25 were clinically free after 6-10 treatments. Twenty-six cows with acute mastitis received, in addition to the above treatment, one g. per lb. bodyweight of sulfamethazine intravenously and clinical improvement was reported.

[No details are given of the number, intervals and methods of the pre- and post-treatment bacteriological tests, thus rendering the results difficult to interpret.]—J. I. TAYLOR.

TSYCHANOV, D. M. (1940.) **[Mass anthrax glucoside vaccine inoculation in reindeer.]**—*Veterinariya, Moscow*. No. 4. pp. 11-17. 1159

Tsenkov's saponin vaccine was used on 21,869 reindeer, without one fatal result, and without the subsequent occurrence of any natural case of anthrax. The dose recommended is 0.3 or 0.6 ml. given subcutaneously. Injection into the subcutaneous tissues round the tail is not recommended.

Vaccination in springtime is followed by a rise in temperature of 0.6° to 1°C. which persists for 2-3 days, a further rise of 0.6°C. occurring on the sixth or seventh day. After vaccination in summer or autumn a rise of 0.9° occurs, maintained for 2-3 days. The local reaction attains a diameter of 5 cm. but disappears leaving no trace in 10-15 days.

Saponin vaccine can be recommended for its ease in preparation, the good immunity it stimulates, and the simplification of the vaccination technique when applied to deer under tundra conditions.—I. W. JENNINGS.

STERNE, M. (1948.) **The effect of inflammation on the survival of guinea pigs infected with anthrax.**—*Onderstepoort J. vet. Sci.* 23. 157-169. 1160

In order to evaluate the effect of inflammation

on immunity in anthrax several factors have to be taken into consideration. When large doses are injected an acute inflammation, caused for example by injection of saponin, has a general inhibitory effect on the development of a virulent strain as well as on a vaccine strain. When small doses are used, this effect is counterbalanced by the increased multiplication rate of the organisms. The antagonistic action between early stimulation due to tissue destruction and late inhibition due to acute inflammation explains the varied results obtained when irritants are used simultaneously with the application of culture. The possible advantages of using 20% NaCl solution as excipient are pointed out.—E. K.-N.

BURNET, F. M. (1948.) **The natural history of tuberculosis.**—*Med. J. Aust.*, Jan. 17th. 57-68. 1161

B. traces the development of tuberculosis in the infected individual, and the influence of age, genetic constitution and environmental factors on infection. Emphasis is placed on prevention and the practical steps which should be taken to ensure protection of susceptible persons.—N. WICKHAM.

MOULE, G. R. (1948.) **Some aspects of the control of bovine tuberculosis in pastoral Queensland.**—*Aust. vet. J.* 24. 2-5. 1162

A high incidence of TB. was found in three herds of beef cattle in Queensland. The major difficulties in the eradication programme were the making of a complete muster and retaining the cattle for 72 hours to read the intradermal test. Short-term testing on large pastoral holdings is also difficult to arrange. Because of the high proportion of non-reacting clinical cases it is considered desirable to slaughter or segregate all old animals.

The suggestion is made that a high incidence of pulmonary TB. observed in bulls may have been due to their habit of fighting or playing when withdrawn from the herd.

Emphasis is laid on the important role of the old, non-reacting, advanced case as a source of infection.—D. C. BLOOD.

McKONE, B. (1948.) **B.C.G. vaccination in the prevention of tuberculosis.**—*Canad. med. Ass. J.* 58. 575-577. [Author's summary and conclusions slightly amended.] 1163

B.C.G. vaccine is innocuous and is of definite value in the prevention of tuberculosis.

It is recommended for use among those negative reactors destined to live and work in a tuberculous or potentially tuberculous environment; infants and children whose parents or other members of the family are stricken with the disease; or young women planning or already training as nurses; and any group working in a

sanatorium environment, are among those recommended for vaccination.

CLEGG, J. W., & FOSTER-CLARK, A. F. (1946.) **Detection of tubercle bacilli by the fluorescence technique.**—*Brit. J. Tuberc.* 40. 98-105. [Abst. from authors' summary.] 1164

An apparatus is described in detail for the routine examination of pathological fluids for tubercle bacilli by the fluorescence method. Results are given of the examination of 748 consecutive specimens, 111 of these specimens were positive by the fluorescence method, and an additional 89 specimens gave positive cultures. The fluorescence method was just as accurate, more sensitive, and more rapid than the Ziehl-Neelsen technique.

SOLOTOROVSKY, M., BUGIE, E. J., & FROST, B. M. (1948.) **The effect of penicillin on the growth of *Mycobacterium tuberculosis* in Dubos' medium.**—*J. Bact.* 55. 555-559. [Authors' summary copied *verbatim*.] 1165

Depending upon the size of inoculum, human, bovine, and avian types of *Mycobacterium tuberculosis* were inhibited by concentrations of penicillin varying from 1 to more than 200 units per ml. When inocula were adjusted to permit 90 per cent transmission of light at 620 m μ through a depth of 19 mm, representing an inoculum of approximately 10⁶ organisms per 10 ml of test medium, growth of the tubercle bacillus was inhibited by drug concentrations of 40 to 200 units per ml. Lower concentrations of penicillin were effective when smaller inocula were used. With a 1:10 dilution of standard cell suspension as inoculum, half the original inhibiting concentration frequently produced complete inhibition of visible growth. This trend was maintained with higher dilutions of inoculum. Among the human strains, no marked difference in sensitivity was observed between a standard laboratory strain (H37Rv) and strains recently isolated from sputum. The strains of bovine and avian type were more sensitive to penicillin than human ones.

DUBOS, R. J. (1948.) **The effect of sphingomyelin on the growth of tubercle bacilli.**—*J. exp. Med.* 88. 73-79. [Author's summary copied *verbatim*.] 1166

All preparations of sphingomyelin tested, whatever the tissues from which they originated, were found to enhance the growth of tubercle bacilli *in vitro*. Cerebrosides were inactive in this respect. Sphingomyelin promotes growth through two independent mechanisms: (a) It neutralizes the toxicity of long chain fatty acids probably by forming with them inert complexes. This protective effect facilitates initiation of growth from small inocula. (b) It supplies to the bacteria

lignoceric acid (or its amide) which is utilized for growth. The base sphingosine, another component of sphingomyelin, does not favor and probably inhibits proliferation of tubercle bacilli.

I & II. RALEIGH, G. W., & YOUNG, G. P. (1948.) **The use of mice in experimental chemotherapy of tuberculosis. I. Rationale and review of the literature. II. Pathology and pathogenesis.**—*J. infect. Dis.* 82. 197-204; & 205-220. 1167

I. Mice were employed for *in vivo* testing of streptomycin, the results comparing favourably with the longer-term g. pig experiments. The authors review the literature (with 58 references) and conclude that the white mouse is more resistant to tuberculous infection than most mammalian species, but that it can be easily and regularly infected with the mammalian and avian types of tubercle bacilli by various routes; that the lesions produced are diversified and not histologically identical with those described for other species.

II. In a series of 14 experiments, albino mice of the Strong A strain, averaging 6-8 weeks of age, were inoculated with *M. tuberculosis*. The findings do not lend themselves to abstracting, and this valuable paper, which traces the evolution and defines the clinical and histopathological pattern produced under the experimental conditions, should be read in full.—W. R. BETT.

III. YOUNG, G. P., & RALEIGH, G. W. (1948.) **The use of mice in experimental chemotherapy of tuberculosis. III. The histopathologic assay of chemotherapeutic action.**—*J. infect. Dis.* 82. 221-225. 1168

III. Of 20 potential chemotherapeutic compounds tested, only streptomycin and *p*-aminosalicylic acid were appreciably effective in suppressing experimental TB. in mice. The authors stress the value of histopathological examination in the detection and evaluation of anti-tuberculous drug activity in mice.—W. R. BETT.

PIERCE, C., DUBOS, R. J., & MIDDLEBROOK, G. (1947.) **Infection of mice with mammalian tubercle bacilli grown in tween-albumin liquid medium.**—*J. exp. Med.* 83. 159-174. [Authors' summary copied *verbatim*.] 1169

Introduction of the bacilli by the intravenous route or by feeding gives rise to a disease predominantly localized in the lungs. Following intracerebral infection, the bacilli first multiply rapidly in the brain tissue, and then invade other organs, producing lesions especially in the lungs. Injection of the bacilli by the intraperitoneal route is less effective than by either the intravenous or intracerebral routes; however, admixture of the bacilli with some of the components of egg yolk

increases both the infectivity and the pulmonary localization.

Different strains of mice differ markedly in their susceptibility to experimental tuberculous infection; the highest susceptibility was observed among the pigmented strains (line 1 dba and C57 black). Greater resistance does not appear to depend on the ability to prevent the establishment of infection, but rather corresponds to a slower rate of progression of the infectious process.

It is possible to produce in mice tuberculosis presenting any desired degree of acuteness or chronicity by controlling certain factors which condition the initiation and the progression of the infection.

KREIS, B. (1946.) **Action d'un anti-histaminique de synthèse sur l'allergie tuberculeuse du cobaye. [Action of a synthetic anti-histamine substance on the tuberculin reaction in guinea pigs.]**—*Ann. Inst. Pasteur.* 72. 308-313. 1170

The possible effect of a synthetic anti-histamine compound on the different aspects of the tuberculin reaction in g. pigs was studied. In none of the experiments was there any clear-cut modification in the response as a result of the use of the anti-histamine compound. The results support the view that histamine is not a factor in determining the reaction to tuberculin.—D. LUKE.

CHASE, M. W. (1945.) **The cellular transfer of cutaneous hypersensitivity to tuberculin.**—*Proc. Soc. exp. Biol., N.Y.* 59. 134-135. 1171

C. sensitized g. pigs with killed human type bacilli suspended in liquid paraffin. Some five to nine weeks later each g. pig was injected intraperitoneally with 28 ml. liquid paraffin to induce a cellular exudate. This was washed out with heparinized Tyrode solution containing gelatin. The suspended cells were then washed and centrifuged.

The injection into normal g. pigs of these washed white blood cells of sensitized g. pigs rendered them sensitive to the injection of tuberculin, marked skin reactions developing after two to three days in 16 of the 17 g. pigs tested.

—W. R. KERR.

CUMMINGS, M. M., HOYT, M., & GOTTSALL, R. Y. (1947.) **Passive transfer of tuberculin sensitivity in the guinea pig.**—*Publ. Hlth Rep., Wash.* 62. 994-997. [Abst. from authors' summary.] 1172

Washed cells (polymorphs, lymphocytes, large mononuclear) from peritoneal exudates of g. pigs which had been sensitized to tuberculin were injected into normal, unsensitized g. pigs. The animals which received the cells then reacted

to an intradermal injection of tuberculin, confirming the work of CHASE [see preceding abst.].

Passive transfer of sensitivity did not appear to be greatly influenced by the age of the donor or of the recipient animals.

YEGIAN, D., & BUDD, V. (1948.) **A variant of *Mycobacterium ranae* requiring streptomycin for growth.**—*J. Bact.* 55. 459-461. [Authors' summary copied *verbatim*.] 1173

The isolation of a variant of a streptomycin-resistant nonpathogenic *Mycobacterium* which requires streptomycin for growth *in vitro* has been described. If such a variant can also develop from susceptible parent strains or streptomycin-resistant variants of cultures of pathogenic tubercle bacilli, its significance in the chemotherapy of tuberculosis is evident. Studies along this line are in progress.

DOYLE, T. M. (1946.) **Vaccination against Johne's disease.**—*J. Min. Agric., Lond.* 52. 442-444. 1174

Brief reference is made to Johne's disease in cattle, and to large-scale vaccination against the disease in France.

D. tested the safety of the vaccine of Vallée and Rinjard. Five calves were given six times the recommended dose and kept under observation for two years and eight months. They remained in excellent health. One animal subsequently passed through two lactations and again became pregnant. Eighteen goats were given large doses of vaccine and remained in good health for two and a half years.

Vaccinated cattle gave weak positive reactions to bovine tuberculin and strong positive reactions to avian tuberculin.

D. considers that vaccination should only be practised in heavily infected herds where the usual methods of control have failed and the economic loss is high. Vaccination in such circumstances should be restricted to the unweaned calves.

—J. DEANS RANKIN.

HANCOCK, J. L., & KELLY, W. R. (1948.) ***Corynebacterium pyogenes* in bull semen.**—*Vet. Rec.* 60. 669-670. 1175

One hundred and fifty samples of semen from 70 bulls in 40 herds were examined culturally for the presence of *Corynebact. pyogenes*: the organism was identified in the semen of 25 bulls from 16 herds. A total of 85 ejaculates was examined from these 25 bulls, the organism being recovered from 73: the numbers of organisms excreted fluctuated widely from sample to sample. *C. pyogenes* was isolated from all of 46 ejaculates examined from eight of the bulls, in which excretion of the organism was maintained for periods up to nine months: this was not incon-

sistent with excellent semen characteristics. There was no significant difference in the conception rates of positive and negative bulls in three herds studied. In those herds where *C. pyogenes* was recovered from the semen of more than one bull there was frequently a marked association with genital infection of the cows, but in only one bull was there evidence of actual invasion of the male genital tract: the significance of the carrier bull is discussed.—CLIVE BRIGGS.

LITHANDER, A. (1948.) **The influence on the formation of antitoxin exercised by dead diphtheria bacilli added to diphtheria toxoid in the immunization of rabbits and horses.**—*Acta path. microbiol. scand.* 25. 439-443. [In English. Author's summary copied *verbatim*.] 1176

In the immunization of rabbits and horses for the production of diphtheria serum the addition of dead diphtheria bacilli to diphtheria toxoid gives as good a formation of antitoxin as the addition of tapioca.

The addition of diphtheria bacilli caused in horses less formation of abscesses and less effect on the general condition than did the addition of tapioca.

I. MILLER, W. R., PANNELL, L., CRAVITZ, L., TANNER, W. A., & INGALIS, M. S. (1948.) **Studies on certain biological characteristics of *Malleomyces mallei* and *Malleomyces pseudomallei*. I. Morphology, cultivation, viability, and isolation from contaminated specimens.**—*J. Bact.* 55. 115-126. [Authors' summary copied *verbatim*.] 1177

II. MILLER, W. R., PANNELL, L., CRAVITZ, L., TANNER, W. A., & ROSEBURY, T. (1948.) **Studies on certain biological characteristics of *Malleomyces mallei* and *Malleomyces pseudomallei*. II. Virulence and infectivity for animals.**—*Ibid.* 127-135. [Authors' summary copied *verbatim*.] 1178

I. Electron micrographs of *Malleomyces* [*Pfeifferella*] organisms show intracellular refractile bodies resembling lipid globules and opaque areas of increased protoplasmic density. *Malleomyces pseudomallei* possesses lophotrichate flagella, whereas *Malleomyces mallei* is atrichous. Both organisms grew well on beef extract base media. *M. mallei* required the addition of glycerol. Both organisms grew well in Luhrs' modification of Long's synthetic medium for *Mycobacterium tuberculosis*. Aeration and oxygenation of broth cultures produced a heavy growth with an even turbidity and little or no pellicle.

Studies of the efficacy of common disinfectant solutions showed "roccal" (benzalkonium chloride), hypochlorite, iodine, and mercuric chloride

to be highly effective. Phenol was less effective and lysol was ineffective. Viability and virulence of cultures were well preserved over periods of at least 3 to 6 months by lyophilization. Both organisms remained viable for at least 4 weeks when suspended in ordinary tap water, and *M. pseudomallei* apparently increased in numbers. Effective methods of isolation of *Malleomyces* organisms from contaminated specimens by differential cultivation, rapid colonial identification, and animal inoculation are described.

II. The various strains of *Malleomyces mallei* [*Pfeifferella mallei*] and *Malleomyces pseudomallei* [*Pf. whitmori*] studied varied greatly in their virulence. The strains of low virulence tended to produce subacute or chronic forms of the diseases, whereas strains of high virulence produced acute fulminating infections. The virulence of one strain (2MP) was increased by serial passage in hamsters.

Hamsters were easily infected by inoculation by the intraperitoneal, subcutaneous, and respiratory routes. Oral inoculation gave irregular results, but some animals became infected after the ingestion of relatively small doses.

Of the laboratory animals tested hamsters were found to be the most susceptible to both diseases. Ferrets were also very susceptible, but guinea pigs were only moderately susceptible and individual animals varied a great deal in the degree of susceptibility. Rabbits, mice, rats, and monkeys were least susceptible.

LEVY, M. L. (1948.) *Listeria monocytogenes* in voles.—*Vet. J.* 104. 310-312. 1179

L. records the isolation of *Erysipelothrix monocytogenes* with typical characteristics from two separate groups of voles kept under laboratory conditions, and suggests the possibility of wild voles being a reservoir of infection. The strains remained alive at room temperature for more than three years, soil infection is thus a possibility.

—JOHN SCARNELL.

ROBERTS, R. S. (1947.) An immunological study of *Pasteurella septica*.—*J. comp. Path.* 57. 261-278. 1180

Cross-protection experiments in mice, using 37 strains from a variety of hosts and from a number of countries, demonstrated that within the species *Past. septica* there existed antigenic types, some of which themselves deserved the status of species. A classification based on the results was loosely related to the species of the host. The main bovine type (I), consisting of 10 strains from cattle and pigs, failed to ferment arabinose, and antibodies corresponding to it were commonly present in normal horse serum. The main avian type (II) consisting of 12 avian, four

bovine and one porcine strain, fermented arabinose and sedimented slowly or not at all in broth culture; four other bovine strains and one porcine strain formed two further types which were related to one another and to type II. An Australian and an Indian avian strain appeared to represent additional types and a rabbit strain and two strains from sheep were not neutralized by any available antiserum.

The interpretation of the cross-protection tests was influenced because the capacity of an organism to break down passive immunity was not necessarily a function of its virulence; some strains of consistently high virulence appeared to have a relatively low power of overcoming serum protection.

It is suggested that until more information is available antisera and vaccines for fowls should be prepared from type II strains and those for cattle and pigs from type I and type II strains.

FOX, O. K., & BURKHART, R. L. (1947.) Hemorrhagic septicemia in swine controlled with sodium sulfamethazine.—*Vet. Med.* 42. 379-381. 1181

An account of infection of pigs with *Pasteurella septica* Type I and of its control by the administration of sodium sulphamethazine.

—D. LUKE.

I. HENRIKSEN, S. D. (1948.) Some unusual mucoid organisms.—*Acta path. microbiol. scand.* 25. 485-492. 1182

II. HENRIKSEN, S. D. (1948.) Serological cross-reactions between unrelated mucoid organisms.—*Ibid.* 493-501. [In English. Author's summaries slightly amended.] 1183

I. Some organisms, rarely seen in the mucoid stage, are described. One was a mucoid strain of *Pseudomonas aeruginosa*, found together with a strain of *Klebsiella*.

The second was a mucoid *Staphylococcus aureus*.

The third and fourth strains, isolated from the same case, were a strain of *Klebsiella* and a mucoid diplobacillus. The colonies of these strains were indistinguishable from each other, and they both were very sensitive to a dry atmosphere at 37°C. They showed a marked pleomorphism, characterized by large swollen cells and spherical bodies, when incubated at 37°C. in a dry atmosphere.

The mucoid diplobacillus was pathogenic to mice, whereas the smooth stage of the same organism has been found to be non-pathogenic.

II. The predominating sero-type among many *Klebsiella* strains isolated from various mild, chronic infections, appears to be some other type than Julianelle's type A. A mucoid strain of

P. aeruginosa was found to be serologically unrelated to a *Klebsiella*, isolated from the same patient. A mucoid diplobacillus showed a marked cross-reaction with a *Klebsiella* from the same patient, and also with a mucoid *Staphylococcus aureus* from a different patient. The former cross-reaction was found to be due, in part at least, to cross-reacting, but different, capsular polysaccharides. The complement-fixation seems to be more sensitive than other reactions in detecting antibodies against mucoid organisms of these types, and, particularly, cross-reacting antibodies.

YOUNG, G. (1947.) **Pigment production and antibiotic activity in cultures of *Pseudomonas aeruginosa*.**—*J. Bact.* 54. 109–117. [Author's summary copied *verbatim*.] 1184

Pseudomonas aeruginosa produces no pigments in culture media containing sufficient glucose (over 1 per cent) to establish and maintain an acid reaction. Pyocyanin is profusely formed in potato glycerol broth, and in glycerol broth both pyocyanin and a fluorescent pigment are produced. Enrichment of the medium with veal infusion or blood inhibits pyocyanin formation even in the presence of glycerol.

Acid cultures of *P. aeruginosa*, which produce no pigments, form no antibiotic substances of any kind.

Pyocyanin inhibits *Escherichia coli*, *Staphylococcus aureus*, and *Mycobacterium smegmatis*. The last two organisms are also inhibited by α -oxyphenazine, ether extracts of acidified cultures, and by chloroform-extracted and ether-extracted culture residues which contain fluorescent pigment. This water-soluble, heat-stable antibiotic which accompanies fluorescence may be the same as that responsible for inhibitory action of other species of fluorescent bacteria.

Pyocyanin in chloroform solution breaks down rapidly into α -oxyphenazine. When it is removed into water solution immediately after extraction, very small amounts of the latter substance are found. α -Oxyphenazine should therefore not be considered as contributing to the natural antibiotic activity of *P. aeruginosa*.

In glycerol broth, pyocyanin production rises to a peak at 8 weeks of incubation and then drops off. The fatty acid fraction becomes more effective in older cultures, whereas the inhibitory material of fluorescent residues is most abundant at 2 weeks.

HENRIKSEN, S. D. (1948.) **Pleomorphism in *Hemophilus hemolyticus* caused by V-factor deficiency.**—*Acta path. microbiol. scand.* 25. 491–498. [In English, author's summary copied *verbatim*.] 1185

Several strains, classified as atypical strains of *Hemophilus hemolyticus*, were found to show

a marked pleomorphism on certain blood agar plates. The pleomorphism was characterized by elongation of the cells and the appearance of fusiform swellings, spermatozoa-like cells and free spherical bodies.

Pleomorphism could be produced at will by reducing the quantity of V-factor in the media. The presence of microbes, such as staphylococci, in the cultures counteracted the lack of V-factor.

It is believed that this type of pleomorphism is due to interference with the mechanism of cellular division by some adverse influence or nutritional deficiency.

McKAY, W. M. (1948.) **Fowl coryza: treatment by iodine.**—*Vet. J.* 104. 70–74. 1186

Good results are claimed for the treatment of fowl coryza on three large poultry farms by the addition of iodine to the drinking water (one teaspoonful of Lugol's solution to a gal. of the drinking water). On two other farms iodine vapour was, in addition, used by volatilizing iodine in the air (10 g. resublimed iodine).

—J. D. BLAXLAND.

PERCH, B. (1948.) **On the serology of the *Proteus* group.**—*Acta path. microbiol. scand.* 25. 703–714. [In English, author's summary copied *verbatim*.] 1187

A report is given of diagnostic antigenic tables of the *Proteus* group, partly in a complete state (with 80 O groups) and partly in a simplified form (with 49 O groups). The division of O groups into types was accomplished by means of H antigens. A total of 98 types is reported in the simplified antigenic table from a study of 588 strains.

WRAMBY, G. (1948.) **Investigations into the antigenic structure of *Bact. coli* isolated from calves with special reference to coli septicaemia (white scours).** pp. 168. Uppsala: Appelbergs Boktryckeriaktiebolag. [In English.] 1188

In 1942 the antigenic concept of the coliform organisms was completely revolutionized by the discovery by Kauffmann that inagglutinability of coliforms was due to the presence of "envelope or surface antigens." With this new knowledge Kauffmann, Knipschildt, and Vahlne set up an entirely new antigenic scheme for the coliform organisms occurring in man, on the basis of O (somatic), K (capsular or envelope) and H (flagellar) antigens. The K antigens are subdivided into L, A and B antigens, each having different properties.

W. made a detailed study of the antigenic structure of coliform organisms which occur in calves, on the basis of the Kauffmann-Knipschildt-Vahlne scheme, using strains isolated from healthy

calves (control material) and from calves which had died from coli septicaemia.

At first O analysis was attempted using only Kauffmann's sera Nos. 1-25. As it was found that very few of the isolated calf strains fell into these O groups, 18 new O antisera were prepared, which were designated 26-43 with the affix "w" to distinguish them from the Kauffmann-Knipschildt sera. Each new serum was tested with the entire range of strains used in preparing the 110 Kauffmann-Knipschildt sera, and only in the case of 37w and No. 51 were the same antigenic factors found. In seven cases Kauffmann-Knipschildt strains had partial antigenic factors in common with test strains for the new O antisera. For O grouping nine polyvalent sera, followed by monovalent sera, were used.

For K antigen analysis the 55 K sera of the Kauffmann-Knipschildt scheme were used. [No mention is made of the L, A and B forms and the author uses the terms K and capsular as if synonymous, although Kauffmann emphasizes that K antigens "do not imply a single sort of antigen but a group of different antigens", and "the term 'K antigen' is not synonymous with capsular antigens, but merely a symbol for either envelope or capsular antigens".] Experimental evidence is given to show that K negative strains may be altered to K positive forms.

Owing to the lack of demonstrable K antigens in the calf strains, 50 coli strains were isolated from fowls with granulomata. These were mucoid strains all possessing K antigens and from their analysis it was shown that some coli strains possess as many as four different K antigens.

Many of W.'s calf strains did not fall into any of the 22 known H antisera, so 14 new H antisera were prepared, which were designated 23-36. The strains representing these new H antigens were cross agglutinated with Kauffmann-Vahlne antisera 1-22, and from the results it is claimed that the new H sera represent entirely new H antigens. It is noted that overlapping factors between H antigens are more frequent than was formerly thought.

Of 5,961 strains examined for O antigens 3,885 fell into one or other of the 43 O groups. 2,116 strains were examined for K antigens using the 22 K antisera and only 456 could be shown to possess them. 1,640 strains out of 2,116 were motile. 97.4% of these fell into one or other of the 36 H groups.

The complete antigenic formulae of the different strains as far as determined are given, and the number of times each strain occurred in normal and diseased material is noted. W. claims that strains isolated from diseased calves are easier to group with the O sera used, and that in

diseased calves the coli strains belong to the same O group more frequently than with strains from control animals. [It is to be noted, however, that 22 of the 24 strains used in the production of the 18 new O antisera were from diseased calves, and the remaining two strains, which were from normal material, had the same antigenic structure.] It cannot be shown that any particular O group is associated with coli septicaemia and the results are inconclusive. If comparison is made exclusively of the coliform flora of the intestines, O groups 8, 15, 9 and 30w are the commonest in that order. If diseased cases alone are considered, the commonest is O group 15.

A higher incidence of K positive forms is found in diseased material than in normal material. This confirms the work of Kauffmann and his collaborators who found that K positive strains were more toxic than strains which lacked K antigens. Strains with K antigens are mainly found in O groups 8, 9, 15 and 18. Positive K forms in the diseased material are more commonly found in the organs than in the intestines.

The practical significance of the newer knowledge of the serology of the coliforms in relation to serum therapy is discussed. Antigenic analysis of strains used in the preparation of polyvalent vaccines used in Sweden against "white scour" show that several strains employed in a vaccine may possess the same antigenic structure, and that K antigens are frequently absent.

A section is devoted to comparison of biochemical properties and serological analysis of certain strains, and it is shown that the biochemical properties are not constant in relation to the serology of the organisms considered.

—MARCUS S. BROOKE.

BURTON, W. H., & GARRARD, E. H. (1948.)

Non-pullorum agglutination reactions. IV.

Reactions with pullorum antigen from fowl inoculated with coliform types.—*Canad. J.*

comp. Med. 12. 20-25.

1189

Intravenous injection of strains of *Colobacterium coli* [*Bact. coli*], *Colobacter aerogenes* [*Bact. aerogenes*], *Paracolobacterium intermedium* [*coli-aerogenes* Group], *Paracolobacter aerogenoides* [*coli-aerogenes* Group], and *Salmonella reading* isolated from fowls with non-pullorum (non-specific) reactions gave rise to agglutinins against the variant form of *S. pullorum* in pullets. Reactions were poorer or absent in hens. Reactions with standard antigen were obtained only from fowls inoculated with *Colobacterium coli* and *Paracolobacterium intermedium*. Titres as high as 1:2,560 were recorded. Egg-laying was delayed 2-3 weeks. Nine of the 36 inoculated birds had pathological lesions or inactive ovaries. Absorption tests showed that factor XII, was common

to all the organisms except *Paracolobactrum intermedium*, which possessed factor XII₃. There is evidence for the supposition that organisms from the intestines of fowls are frequently found in other organs, where they cause low-grade infections and stimulate agglutinins capable of producing cross reactions with pullorum antigen.

—R. GWATKIN.

KAUFFMANN, F. (1948.) **On haemagglutination by *Escherichia coli*.**—*Acta path. microbiol. scand.* 25. 502–506. [In English, author's summary slightly amended.] 1190

The distribution of haemagglutinating coli strains among the various serotypes and O-groups is described. Haemagglutinating coli strains occur more frequently among types of O-groups 4 and 6 than among types of O-groups 8 and 9. There is no direct connection between haemolysis and haemagglutination, and yet nearly all haemolytic strains at the same time are haemagglutinating. The number of haemagglutinating strains is much greater than the number of haemolytic. Of all the types of blood tested (human, guinea-pig, horse, rabbit and chick), guinea-pig blood was agglutinated most strongly. One hour's heating at 70°C. did not destroy the haemagglutinating property of the coli bacteria; this requires brief heating (5 minutes) at 100°C.

FIELD, H. I. (1948.) **A survey of bovine salmonellosis in Mid and West Wales.**—*Vet. J.* 104. 251–266; 294–302; & 323–339. 1191

F. summarizes the literature describing bovine salmonellosis and outbreaks in human beings traceable to cattle in Great Britain. He reports on 70 outbreaks of salmonellosis, 66 caused by *S. dublin*, four by *S. typhi-murium*, in this area of Wales in 1946 and 1947. In 67 of the outbreaks the animals were over one year old and had initial fever; organisms were then present in the blood and milk, dysentery following within 24 hours, organisms then being present in faeces. Most cases died. A few recovered and became carriers. The differential diagnosis is discussed. The laboratory technique required to confirm presumed salmonella infection is described. Faeces samples, blood and milk were examined bacteriologically. Desoxycholate citrate agar and selenite enrichment broth were found to be the best media. A number of variant strains of *S. dublin* were isolated. The agglutination test was employed in serological examination. The normal range of agglutinins in bovine sera to *S. dublin* was determined. Titres of normal adults may be as high as 1:160 for H antigen and 1:40 for O antigen. Agglutinating titres of clinically affected and of adult carrier animals were determined. H titres of 1:320 and above are regarded as positive and

more valuable than O. Antibodies are apparently not produced before the seventh or eighth day of illness. Very young calves do not appear to be able to produce somatic agglutinins. An epidemiological study indicates the importance of the adult carrier cow. Outbreaks occurred, however, without the presence of adult carriers in the herd. The rat was considered as an alternative possible source of infection. It is possible that recovered calves may become carriers as adults. Survival tests in faeces and water were done on *S. dublin*. The relationship between bovine salmonellosis and food poisoning in man is discussed.—J. SCARNELL.

GREGORY, D. W. (1948.) **Salmonella infections of turkey eggs.**—*Poult. Sci.* 27. 359–366. 1192

Turkey eggs dipped in broth cultures of salmonella, and others smeared with a mixture of autoclaved chicken faeces and salmonella broth culture, were incubated under conditions differing as to humidity and temperature. The organisms were found to be capable of penetrating the shell and infecting the contents of the egg. The positive findings were most numerous in the group incubated at high humidity. In a similar experiment in which the contents of the eggs had been replaced by broth, *S. derby* was found to penetrate within 48 hours, whereas *S. typhi-murium* did not do so within the same period. The sucking of broth cultures into egg shells under a negative pressure of 60 ml. Hg led to infection of the opposite surface of the shells in a fair number of cases. Two eggs, subjected to a negative pressure of only 30 ml. Hg gave negative results. The whites of turkey eggs tested *in vitro* appeared to have a mild bacteriostatic action. Hens' egg albumin was somewhat stronger in its action.—A. MAYR-HARTING.

MACKERRAS, M. J., & MACKERRAS, I. M. (1948.) **Salmonella infections in Australian cockroaches.**

[Correspondence.]—*Aust. J. Sci.* 10. 115. 1193

S. bovis-morbificans and *S. typhi-murium* were isolated from cockroaches caught in hospital wards where cases of salmonella infection were occurring. It is not suggested that cockroaches were the cause of the epidemic, but once infected they are a potential means of contaminating food and as they live so long they may become an unsuspected reservoir of infection.—N. WICKHAM.

MAALØE, O. (1948.) **I. Pathogenic-apathogenic transformation of *Salmonella typhimurium*.**

II. Induced change of resistance to complement.

—*Acta path. microbiol. scand.* 25. 414–430; & 755–766. [Author's summaries copied *verbatim*.] 1194

I. The conception of pathogenicity is analysed and split up in three components, *viz.* infectivity, invasiveness (here defined as the faculty

for multiplication inside the invaded organism) and *toxicity* (indicating the general dangerousness of the bacteria). Possible correlations between the three factors are discussed.

Infections with pathogenic and apathogenic strains of *Salmonella typhimurium* are described, and it is shown that the difference in invasiveness between the strains must be caused mainly by a difference in their resistance to the antibacterial forces of the organism (*in casu* complement). No significant difference in toxicity is found between the strains, and morphologically and antigenically they are also identical.

In an experiment 3 new apathogenic cultures are isolated, and the homogeneity of the cultures with respect to invasiveness and resistance to complement is examined. The experiment confirms earlier observations by the writer showing that pathogenic strains are much more resistant to complement than are apathogenic strains. It is shown that in complement-free milieu there is no difference between the phagocytability of pathogenic and apathogenic bacteria.

As opposed to the above described *permanent*, mutative loss of pathogenicity and resistance, the occurrence of a *temporary*, reversible loss of resistance is described. Temporary loss of resistance is found when *e.g.* the resistant strain is grown in diluted bouillon, and it can be prevented by adding glucose or one of several other simple, N-free compounds to the bouillon. That phosphorylation is probably involved in the resistance-producing process, is concluded from experiments with phloridzin, which is shown to lower resistance considerably. Glucose counteracts to some extent the phloridzin effect.

II. The influence of the composition of synthetic media on the resistance of the bacteria formed to the action of complement is investigated. The idea of a specific factor necessary for the development of resistance has to be abandoned. It is shown that, on the contrary, to obtain loss of resistance special growth conditions are needed; *viz.* a high concentration of carbon source should be chosen and ammonia should be preferred as N-source.

The different mechanisms are discussed through which the loss of resistance may occur. BUDDLE, M. B. (1948.) Immunity in cattle vaccinated with *Brucella abortus* strain 19 by the subcutaneous and intracaudal routes during calfood.—*Aust. vet. J.* 24. 262-271. 1195

Intracaudal inoculation with *Br. abortus* strain 19 produced a greater serological response than subcutaneous inoculation.

Two large groups of animals were vaccinated as calves, one by intracaudal and one by subcutaneous inoculation, and exposed to natural

infection, and a single experimental inoculation of virulent organisms was made into the conjunctival sac during their first pregnancy. No differences were observed in serological response, infection and abortion rates, number of live calves or length of gestation period.—D. C. BLOOD.

QUINTIN, T. J., & STALKER, M. R. (1946.) Endocarditis due to *Brucella abortus*.—*Canad. med. Ass. J.* 55. 50-52. [Authors' comment copied *verbatim*.] 1196

This is a proved case of *B. abortus* bacterial ulcerative vegetative endocarditis superimposed on old rheumatic valvular disease. The myocardial, splenic and renal lesions are in part embolic from the vegetations and in part of a more diffuse nature, the result of the bacteraemia. The pneumonitis must be considered due to *B. abortus*. There is, in addition, a non-specific hyperplasia of the splenic pulp and mesenteric lymph nodes.

BEAL, G. A. (1947.) Antibiotic activity of certain molds against *Brucella*.—*Proc. Soc. exp. Biol., N.Y.* 64. 118-120. 1197

Two hundred and two mould cultures of different species were tested for antibiotic activity against *Br. abortus in vitro*, of which 13 were active. Of these, SD-17, classified tentatively as *Aspergillus terreus*, inhibited growth at dilutions of 1:64,000. Its activity is considered to be possibly due to the presence of citrinin.—M. R. O.

KABLER, P., BAUER, H., & NELSON, C. B. (1947.) Human *Brucella melitensis* infections in Minnesota with hogs as the probable source.—*J. Lab. clin. Med.* 32. 854-856. [Authors' summary copied *verbatim*.] 1198

Br. melitensis has been isolated from blood cultures of thirteen human cases of brucellosis. All the patients were men having direct contact with hogs; eleven were packing plant employees and two were farmers. Epidemiologic studies of *Br. melitensis* infections incriminate hogs as the source of infection; in at least two of the cases, the hogs were bred and raised in Minnesota. All human cases of brucellosis due to *Br. melitensis* that have been detected to date are residents of four counties in south-central Minnesota.

MCDONALD, I. W., & COLLINS, F. V. (1947.) Malignant oedema in the pig in Australia.—*Aust. Vet. J.* 23. 50-51. 1199

Three cases of malignant oedema in pigs are described. *Clostridium septicum* was recovered from the lesions. This is apparently the first record of the disease in Australia.—D. F. S.

PACHECO, G., CARDOSO, R. A. DE A., & COSTA, G. A. (1947.) Alterações do sistema nervoso central pelas toxinas do *Clostridium perfringens*. [Lesions in the central nervous system of dogs

caused by *Cl. welchii* toxin.]—*Mem. Inst. Osw. Cruz.* 45. 881-889. [English Abst. p. 889.] 1200

Nine dogs given courses of injections of sublethal doses of purified *Cl. welchii* toxin, over periods varying from 3-14 days, were affected with degenerative lesions of the central nervous system. No gross changes were disclosed on P.M. examination, but constant histopathological lesions were found in the brain and spinal cord of all cases.

Throughout the nervous system there was marked hyperaemia, with small perivascular haemorrhages, and larger extravasations accompanied by lesions in the nervous tissue. In some sections there were perivascular infiltrations of mononuclear cells, both in the white and grey matter, and in all cases there was oedema, either uniformly distributed or scattered.

The diseased nerve cells were found in foci of oedema or haemorrhage, or isolated in small groups in apparently normal tissue, in the cerebrum, cerebellum and spinal bulb and medulla. They showed (according to Spielmeyer's terminology) "acute swelling" and, especially in the large cells of the anterior horn of the spinal medulla, bulb, and in scattered foci of the cerebral cortex, "cellular liquefaction". There were a few shrunken, deeply coloured cells with agglutinated Nissl's granules and sinuous dendrites—"wrinkled cells"—and some lightly stained "shadow cells". Diseased foci had satellite neuronophages and peripheral glial reaction.

In the nerve fibres there was marked change of the myelin sheath, which was sometimes unevenly stained, sometimes fragmented and sometimes distorted into a balloon shape.

Comparing the results with previous work on acute intoxication in the white mouse, the author finds that in the more chronic intoxication, there was more neuroglial proliferation, and there were myelin sheath changes, not found in the acute type.—I. W. JENNINGS.

CROSS, F. W. (1948.) The effect of hydrogen-ion concentration on the yeastlike phase of *Histoplasma capsulatum* (Darling).—*Publ. Hlth Rep., Wash.* 63. 739-746. [Abst. from author's summary.] 1201

The effect of various hydrogen-ion concentrations on the yeastlike phase of five strains of *Histoplasma capsulatum*, in modified Sabouraud's broth, modified beef extract broth and brain heart infusion broth (Difco) was studied. The optimal initial hydrogen-ion concentration for growth was between pH 7.2-7.6 when the cultures were incubated at 37°C. for 5 days, depending on the medium employed. Of the media employed, the brain heart infusion broth provided the optimal conditions for growth at pH 7.4-7.5

and 37°C. The modified Sabouraud's broth employed appeared to be unsatisfactory. In all media employed at 37°C., except Sabouraud's the growth and conversion of the yeastlike phase of *H. capsulatum* decreased as the hydrogen-ion concentration was decreased above the optimal range determined. Hydrogen-ion concentration above the optimal range determined permitted conversion to and growth of the mycelial phase. The hydrogen-ion concentration of a culture medium, although closely related to nutritional requirements and physio-chemical factors, played an important part in the metabolism and growth.

VORONOV, D. L. (1946.) [Epidemiological and ecological data on the distribution of the dermatophytic fungi of man and animals.]—*Med. Parasitol., Moscow*. 15. 70-75. [Abst. in *Bull. Hyg., Lond.* 22. 159. (1947), copied *verbatim*. Signed: D. J. BAUER.] 1202

In an investigation of the role of plant debris and similar materials as a hitherto unsuspected reservoir of infection with dermatophytic fungi, attempts were made to grow various pathogenic fungi on sterile media derived from naturally occurring materials, such as hay, grain, straw, manure, feathers, cloth, etc. Horse and cat *Microsporon* and horse *Trichophyton* grew readily on sterilized straw in tubes of tap water, the growth being mostly beneath the surface of the water. Bovine *Trichophyton* also gave a partial growth on the aerial parts of the straw.

When the tubes of medium were inoculated without previous sterilization, however, it was found that the growth of the dermatophytes was inhibited by the accompanying bacteria. Addition of soil bacteria to sterile cultures of the fungi also inhibited growth; moulds such as *Aspergillus*, *Penicillium*, *Fusarium*, *Alternaria*, *Mucor*, etc., were also inhibitory.

Thus although the dermatophytes can grow on the materials investigated it is improbable that they could do so in natural conditions owing to the inhibitory influence of micro-organisms. It is therefore considered that plant and other debris cannot form a reservoir of infection.

The author has examined more than 1,000 strains of dermatophyte from European and Asiatic Russia; he points out that classification on a morphological basis is unsatisfactory, since wide variations occur in culture, and proposes an ecological classification based on the type of animal in which the fungus normally occurs. The author's classification, with the synonymy given in brackets, is as follows:—

1. *Trichophyton typus humanus* I. (*Tr. endothrix violaceum*).
2. *Tr. typus humanus* II. (*Tr. endothrix crateriforme*).

3. *Tr. typus bovinus* (*Tr. ecto-endothrix megasporon faviforme discoides, ochraceum*).
4. *Tr. typus euginus* (*Tr. ecto-endothrix megasporon faviforme album*).
5. *Tr. typus murinus* (*Tr. microides gypseum*).
6. *Tr. microsporon typus equinus* (*Tr. microsporon equinus*).
7. *Tr. microsporon typus felinus* (*Tr. microsporon lanosum*).
8. *Tr. microsporon typus humanus* (*Tr. microsporon Audouini*)?"

HAYSTON, J. T. (1948.) *Actinobacillosis in sheep*.—*Aust. vet. j.* 24. 64-66. 1203

This is a description of an outbreak of actinobacillosis in a Merino stud in which 25% of the ram population was affected. *A. lignieresii* was isolated from abscesses in skin and lymph nodes of the head. Treatment with potassium iodide was effective.—N. WICKHAM.

SUTHERLAND, A. K., & MORRILL, C. C. (1948.) *An outbreak of leptospirosis in cattle*.—*J. Amer. vet. med. Ass.* 113. 468-471. 1204

An outbreak of disease is recorded in Illinois, in a herd of cattle which had been moved from Texas during the previous year. Two cows had previously died with symptoms of fever, anaemia and dark urine, but a third animal treated with sulphanilamide supplemented with penicillin recovered. When further studied after its nature had been determined the disease was defined as icterus, anaemia and haemoglobinuria, with centrolobular necrosis of hepatic cells and interstitial nephritis. *Leptospira* were demonstrated in liver preparations from g. pigs inoculated intraperitoneally with liver and kidney tissue from an affected cow. The susceptibility of g. pigs to bovine leptospirosis is discussed, and it is pointed out that there has been disagreement among different authors on this point. The temperature in g. pigs may be very fleeting, so infection may be missed. The strain the authors worked with was lost after two g. pig passages.—U. F. R.

BROOM, J. C., & MACINTYRE, A. B. (1948.) *A survey of canine leptospirosis in England*.—*Vet. Rec.* 60. 487-488. 1205

Serum samples from 408 dogs between one and three years of age were tested for the presence of agglutinins against *Leptospira canicola* and *L. icterohaemorrhagiae*. Agglutination in serum dilutions of 1:10 or more was accepted as evidence of previous leptospiral infection. One hundred and eight dogs (27%) gave positive results, 86 were due to *L. canicola* and nine to *L. icterohaemorrhagiae*. The infecting species could not be determined in the remainder. Different breeds had the same infection rate. There was a sugges-

tion of a lower rate of infection in dogs from agricultural areas.—JOHN SCARNELL.

GUIDA, V. O. (1948.) *Estudos sobre a leptospirose canina. [Leptospirosis in dogs.]—Bol. Soc. paul. Med. vet.* 8. 65-69. [English summary.] 1206

Of 15 sera from normal dogs in São Paulo, one possessed leptospira lysins active in a dilution of 1:10,000, and one was active at 1:1,000. One sample was bacteriostatic at a dilution of 1:10,000 and one at a dilution of 1:1,000. The remaining 11 sera had no effect on the *Leptospira icterohaemorrhagiae* suspensions.—I. W. J.

MONLUX, W. S. (1948.) *Leptospirosis. IV. The pathology of canine leptospirosis*.—*Cornell Vet.* 38. 199-208. 1207

M. gives a detailed account of the changes found in 17 dogs in which he produced the acute haemorrhagic and acute icteric types of leptospirosis by the injection of five strains of *L. icterohaemorrhagiae* and two untyped strains from icteric dogs. Lesions in the two types of disease were identical apart from the icterus and greater liver damage in the icteric type. They comprised petechial and ecchymotic haemorrhages into all the tissues of the body, and gross haemorrhage into the gall bladder and intestinal lumina, the uveal tract of the eye, and in one case the thalamus of the brain. There was little or no inflammatory reaction to the leptospira, but erosions were noted on the mucous surfaces of the upper respiratory and the alimentary tracts.—I. W. JENNINGS.

EYQUEM, A. (1948.) *Reproduction de la maladie hémolytique expérimentale à l'aide d'iso-immuns-sérums. [Experimental haemolytic jaundice in dogs following the injection of anti-erythrocyte serum.]—C. R. Soc. Biol. Paris.* 142. 910-911. 1208

Twelve dogs received repeated injections of red cells from other dogs, and iso-agglutinins were subsequently demonstrated in four. One ml. of an immune serum so prepared, was injected subcutaneously or intraperitoneally into each of a number of puppies [number not stated] less than eight days old, weighing 200 to 250 g., the red cells of which were agglutinated by the serum *in vitro*. Clinical and haematological features of typical haemolytic jaundice resulted; all the puppies died in three or four days. Puppies, the red cells of which were not agglutinated by the antiserum, were similarly injected but remained unaffected.—G. F. R.

BAWA, H. S. (1946.) *Contagious pleuropneumonia of goats with special reference to immunisation*.—*Indian j. vet. Sci.* 16. pp. 1-10. 1209

Some account of this well-known disease, as

it occurs in Sind. Outbreaks may be expected to continue for a month or two with 60–80% mortality. Abortion is common. It is suggested that outbreaks are more common in certain months, *e.g.*, July and August, due to "inclement" weather. (This statement is unsupported by data.)

A formolized vaccine, prepared from lung tissue, is recommended for controlling outbreaks and has been in growing use in Sind since 1938. [There is no mention of controls.]—F. C. MINETT.

NELSON, J. B. (1948.) **The nasal transmission of pleuropneumonia-like organisms in mice and rats.**—*J. infect. Dis.* 82. 169–176. 1210

N. confirmed that mouse to mouse passage of macroscopically normal mouse lung material may ultimately result in a pathological condition of the lung from which pleuropneumonia-like organisms can be isolated. He further found that an inflammatory involvement of the middle ear is present in cases of infection with pleuropneumonia-like organisms. He therefore points out that examination of the middle ear and the nasal passages is of importance for the diagnosis of rodent pleuropneumonia. The disease resembles the condition caused by the virus-like agent described by N. in former papers, but can be differentiated from it by cultural examination.—E. K.-N.

DEMEREK, M. (1948.) **Origin of bacterial resistance to antibiotics.**—*J. Bact.* 56. 63–74. [Author's summary copied *verbatim*.] 1211

A method is described that has been used to determine whether resistance to streptomycin is induced by interaction of the compound with bacteria or originates by gene mutation. Data are presented indicating that mutations are responsible for the origin of streptomycin resistance in *Staphylococcus aureus*. These agree with previously published data regarding the origin of penicillin resistance in the same organism.

The stepwise increase of resistance to penicillin by selection is explained by assuming that mutations in several equally potent genes are effective in inducing resistance, and that the slight degree of resistance characteristic of the first step is due to a mutation in one of these genes, the higher degrees of resistance of subsequent steps to successive mutations in other genes.

The increase in resistance to streptomycin also can be explained by the assumption that several genes are instrumental in the process. These genes vary greatly in their potency, however, and consequently a mutation in a highly potent gene will be responsible for a high degree of resistance, a mutation in a less potent gene for a low degree of resistance.

From the knowledge gained concerning the

mechanism of origin of resistance, it is concluded that in treatment with penicillin the development of highly resistant strains can be avoided by application of the penicillin in doses sufficiently large to prevent survival of first-step resistant mutants. In treatment with streptomycin, however, the development of highly resistant strains cannot be prevented; effective treatment does not eliminate all bacteria, but it probably reduces their number to a level at which the organism is able to eliminate them.

KNOX, W. E., STUMPF, P. K., GREEN, D. E., & AUERBACH, V. H. (1948.) **The inhibition of sulfhydryl enzymes as the basis of the bactericidal action of chlorine.**—*J. Bact.* 55. 451–458. [Authors' summary copied *verbatim*.] 1212

Chlorine in bactericidal amounts or less inhibits various sulfhydryl enzymes and other enzymes sensitive to oxidation. Inhibition of essential enzymes in this way causes death of the bacterial cell; inhibition of glucose oxidation is paralleled by the percentage of bacteria killed. The aldolase of *Escherichia coli* has been shown to be one of the essential enzymes of glucose oxidation sufficiently sensitive to chlorine to explain its bactericidal effect.

BICHOWSKY-SLOMNITZKI, L. (1948.) **The effect of aromatic diamidines on bacterial growth. I. The mechanism of action.**—*J. Bact.* 55. 27–31. [Author's summary copied *verbatim*.] 1213

Five aromatic diamidine compounds were tested for their antibacterial effect on *Escherichia coli* and *Staphylococcus aureus*. Stilbamidine and pentamidine were found to be the most active of the five compounds. Under identical conditions, *E. coli* is more resistant to the growth-inhibiting action of these compounds than is *S. aureus*. However, the zone of inhibition of growth unaccompanied by bactericidal action is narrower in the case of *E. coli* than in that of *S. aureus*.

FERGUSON, J. D., REINOLD, D. G., & WRIGLEY, F. (1948.) **Dimethylsulphanilamido-isoxazole (NU-445) in urinary infections.**—*Lancet*. 255. 969–971. [Abst. from authors' summary.] 1214

NU-445 was used to treat a controlled series of cases of coliform infection of the urinary tract. The advantages claimed for the preparation were high solubility in urine (minimising the risk of crystalluria), effective antibacterial activity against Gram-negative organisms, and extremely low toxicity.

Sixty cases of cystopyelitis in women were treated, alternate cases receiving NU-445 and sulphamezathine [sulphamethazine] in similar dosage. NU-445 appeared to fall into the class of optimally active sulphonamides, and it compared favourably with sulphamezathine in its effect on

Gram-negative urinary infections. Although, for purposes of control, the dosage of NU-445 was lower than its solubility warranted, NU-445 achieved more rapid bacteriostasis than sulphamezathine in uncomplicated cases of cystopyelitis. In a small number of cases which proved resistant to sulphamezathine the infection cleared rapidly with NU-445. No toxic effects were observed in any case treated with NU-445, and it seems probable that the preparation may safely be given in much higher dosage to the more resistant cases of urinary-tract infection.

KNAYS, G. (1948.) **The endospore of bacteria.**—*Bact. Rev.* 12. 19-77. 1215

A review of the varied conceptions of the cytology of the resting bacterial endospore is followed by detailed reports of the work of various investigators on the methods of endospore formation and spore germination. The biological nature of the endospore is discussed. A short paragraph is devoted to the chemical composition and antigenic structure of endospores. The relation of the environment to the formation and germination of the endospore is dealt with. It is here pointed out that the various factors influencing sporulation, such as the temperature, the concentration of oxygen, the state and density of the population, the utilization of nutrients, the accumulation of the metabolic products, the pH, etc., are intimately interrelated. In the last paragraph dealing with the environmental factors favourable to germination of spores the phenomenon of dormancy is particularly discussed and K. is of the opinion that "it is possible to raise, at will, the percentage of germinating spores by controlling the composition and the reaction potential of the medium".—E. KLIENEGER-NOBEL.

KIVELA, E. W., MALLMANN, W. L., & CHURCHILL, E. S. (1948.) **Physical action of surface-active cations upon bacteria.**—*J. Bact.* 55. 565-572. [Authors' summary copied *verbatim*.] 1216

The bacteriostatic effect of surface-active cations on bacterial spores can be reversed by dilution and shaking in distilled water or physiological saline solution. The reversal of the bacteriostatic effect of surface-active cations by the removal of the cations adsorbed on the bacterial spores by dilution was proved by demonstrating that negative mobilities of the spores were restored by washing the cells with distilled water. The high osmotic pressure exerted on the bacterial cell by the adsorbed surface-active cation may explain, in part, the destruction of vegetative cells by the discharge of cell fluid into the suspending solution.

KLIENEGER-NOBEL, E. (1948.) **Capsules and mucoid envelopes of bacteria.**—*J. Hyg., Camb.*

See also absts. 1385 (bacteria in semen); 1396-1398 (technique); 1402 (metal caps for test tubes).

46. 845-848.

1217

Capsules and slimy envelopes occur in bacterial cultures which have a mucoid appearance or an opaque growth. A capsule is distinct from a mucoid envelope, morphologically and biochemically, the capsule being part of the bacterium and the mucoid envelope, or slime, a secretion.

Some confusion arises in their differentiation and the author developed new methods for fixing and staining, positively, which differentiate between them. Two methods are described for capsules and one for slime. The results obtained in examining 50 cultures, mucoid, opaque, non-mucoid and transparent, of different organisms are reported.

The capsule is of definite shape and outline, the slime is amorphous. Some bacteria have capsules (e.g., *B. lactis aerogenes*, *Bact. coli*) some produce only slime (e.g., *Myxococcus fulvus*) and in others the capsulated organisms may be embedded in amorphous slime (e.g., *Pneumococcus*, type III, Friedländer's bacillus).

Fourteen photographs are printed, on two plates. Ten references are also given.—M. W.

VANDERLINDE, R. J., & YEGIAN, D. (1948.) **Streptomycin-dependent bacteria in the identification of streptomycin-producing microorganisms.**—*J. Bact.* 56. 357-361. 1218

Only a few strains of *Streptomyces griseus* produce streptomycin, and to find such strains is a laborious procedure. An attempt was made to use organisms that required streptomycin for growth as detectors of streptomycin-producing strains. A culture of *Staph. aureus* and one of *Proteus morgani* were discarded because they produced mutants growing in the absence of streptomycin. A strain of *Bact. coli* and one of *Ps. aeruginosa*, neither of them producing such mutants, could be trained to grow in quantities of streptomycin as small as 1 µg. per ml. These two strains proved to be very suitable for rapid and accurate detection of streptomycin-producing strains. Strains of actinomycetes, under test for the production of streptomycin, are inoculated into the centre of plates containing no streptomycin. The organisms requiring streptomycin are then inoculated in streaks running from the centre to the periphery. If the actinomycetes produce streptomycin, the indicator organisms show growth near it, but not at the periphery of the plate. Control streaks with streptomycin-sensitive organisms show the reverse picture, growth only at the periphery. Streptomycin-resistant organisms grow along the whole length of the streak. This method can also be used for the titration of streptomycin in the body fluids of patients.—A. MAYR-HARTING.

DISEASES CAUSED BY PROTOZOAN PARASITES

KLEINE, F. K. (1946.) Unterschiede in der Bekämpfung der afrikanischen und der russischen Trypanosomiasis. [Differences in the control of African and Russian trypanosomiasis.]—*Ztschr. f. d. Deut. Gesundheitswesen*. 1. 143-144. [Abst. in *Trop. Dis. Bull.* 45. 689-690. (1948), copied *verbatim*. Signed: J. F. CORSON.] 1219

Domestic animals in southeastern Russia, where camels are much used in agriculture, are infected with surra (*Trypanosoma evansi*); as the trypanosome is directly and mechanically carried from one animal to another by tabanid and other biting flies which do not themselves become infected, the control of surra would seem to be less difficult than that of those African trypanosomiasis transmitted by tsetse flies which become infected and form an additional reservoir of the trypanosomes. The author refers briefly to the various wellknown methods of controlling trypanosomiasis in man and animals.

As *T. evansi* and *T. brucei* resemble each other so closely in appearance it is thought that they are nearly related, but the former apparently cannot develop in tsetse flies; Kunert and Krause (1934) failed to infect *Glossina morsitans* with a strain of *T. evansi* isolated less than a year previously. [As was noted by the reviewer of their papers, the direct transmission of *T. evansi* by *G. morsitans* as late as the 3rd and 5th days after they had fed on an infected animal is remarkable; further experiments on direct transmission of pathogenic trypanosomes are desirable.]

ELST, O. V. (1948.) Le bromure de dimidium traitement curatif de la trypanosomiose des bovidés. [Phenanthridinium bromide in treatment of trypanosomiasis in cattle.]—*Bull. agric. Congo belge*. 39. 181-186. 1220

Dimidium bromide (phenanthridinium compound 1553) was used on a large scale for the treatment of *T. congolense* infection of cattle in North Katanga, where the stock are principally Afrikanders, Devons or Herefords. It was given intravenously as a 2% solution, at a dose rate of 8 mg. per 10 kg. live weight. In treating 150 cattle, 78% recovered after one treatment, 12.5% after two treatments, and 9.5% after a third treatment. In treating relapsing animals double doses were used, one animal of 510 kg. receiving three doses of 0.4 g. and four doses of 0.8 g., or a total of 4.4 g., without ill effects. Attention is drawn to records of photosensitization reported after subcutaneous inoculation, but this accident was not encountered when the drug was used intravenously.—U. F. RICHARDSON.

RUBIN, B. A. (1948.) The trypanocidal effect of

antibiotic lactones and of their analogs.—*Yale J. Biol. Med.* 20. 233-272. 1221

This is a highly technical article. The remarkable properties of penicillin and the newer antibiotics stimulated interest in the possibility of similar specific non-toxic agents effective for protozoan diseases. Two types of chemically defined antibiotic have the desired antiprotozoan activity, one group being closely related to the already extensively studied acridines. The second effective structure is that of prodigiosin, and 44 compounds of an analogous series related to antibiotic lactones were prepared and examined for *in vitro* and *in vivo* trypanocidal activity, antibacterial action and toxic effects, the trypanocidal activity being tested on mice infected with *T. equiperdum*.

In an interesting discussion on drug action it is pointed out that to study such a problem satisfactorily it is necessary to interrelate the drug, the parasite, and the host.

It is concluded that the activity in series depended on the size of the basic ring, the nature of the side chains, and the number and position of unsaturated linkages. Delta lactones were more active than gamma lactone analogues. Most side chains reduced activity. More unsaturated linkages increased activity. Three lactones had significant *in vivo* effect: 2-pentene-1,4-olide, penicillic and coumalinic acids. *In vivo* activity did not correlate with *in vitro* effects.

Three furans were significantly active *in vivo*: furfural, furfuryl alcohol and furacin. The last could cure 100% of the mice with a single oral dose of low toxicity.

The antibacterial and toxic effects of the 44 agents were not quantitatively related to trypanocidal activity.—U. F. RICHARDSON.

COOPER, R. J. (1948.) Trichomoniasis. The breeding record of a bull over two years known to be infected with *Trichomonas foetus* (str. belfast).—*Vet. J.* 104. 266-272. 1222

A bull, naturally infected with *Tr. foetus* (str. belfast), was treated using hydrarg. perchlor. and acriflavine irrigations, followed by six months' breeding rest. The bull was then used for two years, semen always being collected by artificial insemination. When it was slaughtered at the end of that time, *Tr. foetus* was isolated from the prepuce and urethra. The penis appeared normal, though at the time of infection it had been acutely inflamed.

When artificial insemination commenced, the semen was of very poor quality, but within three weeks improved greatly. After seven months, however, it was too poor to be used for insemina-

tion. The bull always served vigorously. The author attributes the deterioration of the semen to the chronic trichomonad infection.

During the two years, 40 non-infected cows were inseminated by its semen. Thirteen calved after the first insemination; 19 usually had a discharge; after treatment they conceived to another bull.—G. M. URQUHART.

ANON. (1948.) *Trichomoniasis in cattle.*—*Tasm. J. Agric.* 19. 153. 1223

To protect Tasmanian cattle from infection with *Tr. foetus*, the importation of cattle, except steers and young calves, from King Island is prohibited because of the occurrence of the disease there. Cattle will be accepted for immediate slaughter.—D. C. BLOOD.

DUMARESQ, J. A. (1948.) *A note recording the presence of Trichomonas foetus infection of cattle on King Island.*—*Aust. vet. J.* 24. 282. 1224

Trichomoniasis was detected in a clinical case on King Island in 1946. Vaginal discharges from cows in other herds and the study of pyometra specimens at abattoirs on the island showed infection to be widespread.—D. C. BLOOD.

FLORENT, A. (1948.) *Le pouvoir agglutinant du mucus vaginal vis-à-vis des Trichomonas, phénomène d'immunité locale dans la trichomoniasse du bétail. [Agglutinins in vaginal mucus in bovine trichomoniasis.]*—*C. R. Soc. Biol. Paris.* 142. 406-408. 1225

F., who previously described the technique for the agglutination of *Trichomonas bovis* by vaginal mucus from recovered cows [V. B. 18. 498], now shows that in three out of five experimental heifers there existed agglutinins in the vaginal mucus without any simultaneous humoral reaction. In 93 field samples submitted for diagnosis, all gave an evident agglutination of *Tr. bovis* with vaginal mucus, but 12 of these, i.e., 36%, did not have detectable antibodies in the serum. Conversely, while parenteral inoculation of *Tr. bovis* increased the antibody content of the blood, it did not influence the agglutinating properties of the vaginal mucus. One of the two cows used in this part of the experiment, already had antibodies in the blood before it was given the injections. [F. does not mention whether this cow was naturally or artificially infected, nor whether the agglutinins were non-specific.]

The author concludes that in natural conditions (as seen in one cow prior to inoculation with *Tr. bovis*) and in experimental conditions (two cows after inoculation) blood agglutinins do not pass in perceptible amount into the vaginal mucus.

—JAS. G. O'SULLIVAN.

MACDONALD, E. M., NELSON, P. M., BYRNE,

H. J., & TATUM, A. L. (1948.) *Trichomonas foetus: experimental infection in rabbits.*—*J. Immunol.* 59. 295-300. 1226

This experiment involved the use of 76 rabbits, three months to two years old, and three strains of *Tr. foetus*, one strain being cultured in egg medium, one recovered after serial passage through three rabbits, and one recovered after passage through four rabbits. Infection was intra-vaginal and each inoculation of 15 ml. fluid contained one million trichomonads per ml. Infections were diagnosed by the detection of motile trichomonads in vaginal smears, the degree of infection being proportional to the number of trichomonads observed. Negative smears for 15 successive days were considered to indicate the termination of infection.

An average infection incidence of 67% was obtained, and it was found that the first appearance, duration, and severity of infections were irregular and the course of infections unpredictable. Animal passage did not significantly increase the degree of infectiveness, nor did three daily inoculations of infective material. The authors conclude that rabbits are unsatisfactory experimental animals for a study of the chemotherapy of trichomoniasis.—G. M. URQUHART.

TATUM, A. L., & MACDONALD, E. M. (1948.) *In vitro action of various chemical agents on Trichomonas hominis, Trichomonas vaginalis and Trichomonas foetus.*—*J. Immunol.* 59. 301-308. 1227

Twenty-four bacteria-free cultures of *Tr. hominis*, *Tr. vaginalis*, and *Tr. foetus* were used, and 0.1 ml. of the culture was mixed with 0.1 ml. of saline dilutions of the drugs. Preparations were observed for one hour and cessation of trichomonad motility was the criterion of drug activity.

One hundred and three drugs were tested, embracing common chemicals, dyes, mercurial antiseptics, and detergents. *Tr. hominis* and *Tr. vaginalis* reacted alike to the drugs, while *Tr. foetus* in each case was more resistant.

Dyes appeared to be ineffective, and mercurial antiseptics effective in low concentrations, while certain concentrations of detergents produced dissolution of the trichomonads without prior immobilization.

The addition of gastric mucus inhibited the mercurial drugs, but did not greatly affect the detergents.

Five detergents were tested for their irritant action on mucous membrane by instillation into rabbit conjunctivae with no serious results.

—G. M. URQUHART.

MACDONALD, E. M., & TATUM, A. L. (1948.) *The differentiation of species of trichomonads*

by immunological methods.—*J. Immunol.* 59. 309-317. 1228

Formalin-killed trichomonads were used to prepare antigen. Two groups of five rabbits each were injected intravenously on at least five occasions at 4-day intervals with *Tr. hominis* and *Tr. vaginalis* antigen respectively. One rabbit was similarly immunized with *Tr. foetus*. Immune sera was obtained 4-6 days after the last injection of antigen.

Agglutination tests were carried out using both microscopic and tube agglutination methods. Antisera tested against *Tr. vaginalis* or *Tr. hominis* titrated to the same end point while homologous antisera tested against *Tr. foetus* titrated to a higher end point than did heterologous antiserum.

Antibody-absorption tests showed that specific absorption of antisera, by either *Tr. hominis* or *Tr. vaginalis*, removes the antibodies for both. Absorption by *Tr. foetus* removes the same amount of antibodies to *Tr. hominis* as to *Tr. vaginalis*.

Agglomeration (*i.e.*, the aggregation of motile trichomonads in rosettes, so that the posterior ends are to the centre and the flagella continue to beat actively) tests were carried out with the antisera and much higher titres obtained than in agglutination titrations, though the results were essentially the same.

Data from cross-absorption tests of agglomerating antibodies gave parallel results to those obtained in agglutinin-absorption tests.

No precipitative reactions were elicited from the sera.

The authors conclude that *Tr. hominis* and *Tr. vaginalis* are antigenically identical.—G. M. U.

STABLER, R. M. (1948.) Variations in virulence of strains of *Trichomonas gallinae* in pigeons.—*J. Parasit.* 34. 147-149. 1229

Twenty *Trichomonas*-free pigeons were divided into five series of five comparable birds each, and five strains of *Trichomonas gallinae* used to infect a different bird in each series.

The strains of *Tr. gallinae* were isolated from the mouths of five birds, two of which had cankerous lesions in the mouth and throat. The strains were maintained by successive passage through clean pigeons.

There was a marked variation in strain virulence, one strain producing no visible pathology, one strain killing four out of five birds, and the other three strains producing effects of moderate virulence. Fatal infections ran a course of ten days from the time of inoculation.—G. M. U.

STABLER, R. M. (1948.) Protection in pigeons against virulent *Trichomonas gallinae* acquired by infection with milder strains.—*J. Parasit.* 34. 150-153. 1230

Three strains of *Tr. gallinae* were used. In a previous experiment [see preceding abst.] Strain 1 killed four out of five infected birds, Strain 2 killed three out of five infected birds, and Strain 3 produced slight caseous lesions in two out of five infected birds.

In the first experiment, eight unfledged pigeons were orally infected with Strain 2. Six survived, and were allowed to recover completely before being inoculated with the test Strain 1. No signs of caseation were observed and after 29 days, when the birds were killed and examined P.M., there were no signs of active trichomoniasis.

In the second experiment eight birds were orally infected with Strain 2. Two birds had slight caseous lesions and, after their recovery, all were infected with Strain 1. Only two birds had caseous lesions, and on P.M. examination considerable liver scarring was demonstrated in one of these. There were no lesions of trichomoniasis in the other birds.

As a control measure Strain 1 was used to infect 13 healthy pigeons, and killed 12 of them. The author concludes that recovery among pigeons from *Tr. gallinae* infection appears to be accompanied by protection against subsequent attack by a more virulent strain.—G. M. U.

ANON. (1948.) Coccidiosis in cattle.—*Vet. Rec.* 60. 518. 1231

In reply to the question:—What is the diagnosis, prognosis and latest treatment for coccidiosis in cattle?—two answers are given.

(1) Diagnosis may be made on the clinical picture, and may be confirmed by microscopic examination of faeces. The treatment recommended is mepacrine hydrochloride 1 g. per 200 lb. bodyweight daily, given in two doses *per os*. Treatment should be continued for four days, after which the animal may return to pasture. This treatment is recommended on account of its cheapness compared with sulphonamide.

(2) This author favours treatment with sulphamethazine and kaolin in medicinal doses at 12-hourly intervals for four days, and mentions the importance of disinfection in this disease.

—R. M. LOOSMORE.

JACOBY, N. M., & SAGORIN, L. (1948.) Human toxoplasmosis in England. Report of a case.—*Lancet.* 235. 926-930. 1232

Very few cases of toxoplasmosis have been recorded in England, although many cases have been recorded in recent years from the U.S.A., S. America, Continental Europe and Australia.

A congenital case in a four-month-old infant is described. The child was from a house at one time occupied by a veterinary practitioner. The present occupiers did not keep any domestic

animals, but the house was rat infested. The child had enlargement of the skull, nystagmus, and was almost blind. The child's mother had neutralizing antibodies in the serum.

It is pointed out that toxoplasma infection of the squirrel in England was reported by COLES as long ago as 1914 and from various animals and birds at the London Zoo by PLIMMER (1916). A

See also *abst.* 1356 (dimidium bromide).

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

LECLAINCHE, E. (1946.) L'épizootie aphteuse de 1937 à 1946—II. **[Foot and mouth disease outbreaks from 1937 to 1946. II.]—Bull. Off. internat. Epiz.** 26. October. 24-33. 1233

This review covers the period from 1944-46. Notes or statistics are given of the occurrence of F. & M. disease during these years in France, Belgium, Germany (incomplete), Holland, Denmark, Norway, Sweden, Roumania, Italy, Spain, Portugal and Greece. In general, there has been a continuation of the gradually decreasing incidence of the disease from the peak of the 1937-38 epizootic occasionally disturbed by slight increases and never disappearing completely.—W. M. H.

ZAVAGLI, V. (1948.) La lotta contro l'aftha epizootica panorama di due continenti. **[Review of foot and mouth disease control in two continents.]—Zooprofilassi.** 3. No. 4. pp. 1-9. 1234

Z. contrasts the different methods of foot and mouth disease control which have been adopted on the continent of Europe on the one hand and in Great Britain and in the U.S.A. on the other, showing how the methods used in different parts of the world were justified by prevailing conditions. In continental Europe the vaccination method was a safeguard against the frequent risk of the spread of infection which has tended to come from the east. An island country like Great Britain could afford to adopt the more drastic and costly method of "stamping out" the disease in its initial foci. He refers to the research at present being carried out at the Experimental Station at Pirbright on the preparation of a vaccine utilizing the attenuating power of crystal violet on the virus in blood, and considers that this method represents a substitute enormously inferior to the Waldmann vaccine, and that probably before long, if British scientists turn to the preparation of an adsorbed vaccine, the vaccination method will be adopted in Great Britain in addition to the stamping out procedure, as in Switzerland.

The U.S.A. had followed Great Britain in adopting the stamping out method of control. Z. reviews the history of the various outbreaks in the U.S.A. and describes the costly campaign now

being undertaken by the U.S. government against the disease in Mexico at a cost of some 60 million dollars. It is pointed out that although the stamping out method alone succeeded in the U.S.A., where there has been no outbreak since 1929, various factors hindered its success in Mexico and in 1947 vaccination was authorized in addition.

Now that distance and even sea frontiers have been nullified by modern methods of transport the importance of vaccination has increased and international conferences are now busy on the subject of a uniform type of vaccine.—F. E. W.

DEVOS, A. (1946.) Kantteekeningen bij de vaccinatie tegen mond-en klauwzeer. **[Reactions (in different species of animals) to vaccination against foot and mouth disease.]—Vlaam. Diergeneesk. Tijdschr.** 15. 21-24. [English, French & German summaries.] 1235

A brief note is given of the use of vaccine in the control of F. & M. disease with a short description of the local reaction produced by the subcutaneous inoculation of aluminium hydroxide vaccine.—W. M. HENDERSON.

MICHELSSEN, E. (1948.) Haemagglutinationsforsøg med Mund- og Klovesyggevirus og Rotteblod. **[Haemagglutination tests with foot and mouth disease and rats' blood.]—Maanedsskr. Dyrlaeg.** 59. 465-468. [English summary.] 1236

Infective vesicular lymph from g. pigs or cattle was shown to agglutinate the erythrocytes of rats. No evidence is presented to indicate that the haemagglutinin present in such lymph is the F. & M. disease virus.

Negative results were obtained with the erythrocytes of cattle, sheep, goats, g. pigs, rabbits, fowls and pigeons.—H. H. SKINNER.

MICHELSSEN, E. (1948.) Mund- og Klovesyggevirus. Nogle teoretiske Forsøg med intermediate Typevarianter. **[Foot and mouth disease virus. Theoretical experiments with intermediate type variants.]—Maanedsskr. Dyrlaeg.** 60. 37-43. 1237

The author discusses variant strains of F. &

M. disease virus in which there is, apparently, some relation to more than one of the immunological type groups. TRAUTWEIN & REPPIN'S (1931) work with strain "Argentine 1" is considered in detail and theoretical conceptions of the antigenic components that may be present are suggested in an attempt to explain its paradoxical behaviour in cross-immunity tests.

The results of cross-immunity tests, complement-fixation tests and serum-neutralization tests are given for strain "Palau" with its classification as a "Co" variant.—W. M. HENDERSON.

FOGEDBY, M. E. F., & MICHELSEN, E. (1947.) La culture du virus aphteux et l'utilisation du virus de culture. [Culture of the foot and mouth disease virus and use made of the cultured virus.]—*Bull. Off. internat. Epiz.* 27. 201-220. 1238

A comprehensive review is given of the development of the technique of *in vitro* culture of foot-and-mouth disease virus with a consideration of the various factors involved based on the results of the authors' investigations. They used the calf foetus method [see FRENKEL & VAN WAYEREN, *V.B.* 6. 324] comprising (1) virus of bovine origin, (2) tissue from the bovine foetus, usually skin or lung, and (3) bovine plasma plus Tyrode's solution or Tyrode's solution alone.

Using a Vallée O type virus strain a number of culture series were made, one being carried to the 60th passage during the course of which the virus titre varied between 10^{-3} and 10^{-5} (tested on g. pigs); the type remained stable and the ability to produce the disease in cattle was retained. The virus titre usually reached its maximum after about 48 hours' culture at 37°C. A slight drop in pH was observed during the period of incubation of the culture from an initial value of about 8.0 to about 7.6 at 40 to 48 hours.

From time to time the authors found that whereas low dilutions of the culture virus produced few small reactions in g. pigs, higher dilutions produced many severe reactions. They suggest that this paradox might be explained by formation of antibody in the culture that is eliminated by the "dilution" phenomenon. They also noted that phosphate suspensions of culture virus stored in the cold produced more severe reactions in g. pigs than when used freshly prepared.

A number of attempts were made to increase the yield of virus by addition of various substances, *viz.*, chick embryo extract; calf embryo lung, spleen and thymus extracts; gonadotropic hormones; calf thyroid; all with no effect; and extract of the mucosa of the bovine small intestine which was followed by a slight increase in titre. Treatment of the tissue cells beforehand with a

hypertonic saline solution, *e.g.*, five min. in 2% NaCl, produced an increase in titre. The degree of multiplication of the tissue cells did not appear to be of importance.

A review is given of the use of culture virus in methods of immunization, particularly vaccine production. Although good results can be obtained using culture virus for preparation of vaccine, the authors consider that a sufficiently consistent degree of success has not yet been obtained for it to replace the infected animal as the source of virus.—W. M. HENDERSON.

GIROUD, P., & JEZERSKI, A. (1947.) I. Essai de culture *in vivo* sur le lapin du virus aphteux O. [Multiplication of foot and mouth disease in the rabbit.] II. Comportement sur poumon de lapin de mélange du virus aphteux O et des rickettsies du typhus épidémique. [Action on the lung of the rabbit of a mixed infection with foot and mouth disease virus and rickettsia.] III. Pouvoir antigène et vaccinant de la lymphé de lapin virus aphteux O sur cobaye et sur mouton. [Antigenic and immunizing activity of rabbit-passaged foot and mouth "O" virus in g. pigs and sheep.]—*C. R. Soc. Biol. Paris.* 141. 1180-1181; 1181-1182; & 1182-1184. 1239

I, II & III. By giving an initial intratracheal inoculation of virulent g. pig pad material and subsequent intratracheal inoculations of lung tissue collected at the fourth to fifth day the F. & M. virus was successfully passaged five times in young rabbits. Doses were massive and some of the rabbits were kept at 37°C. and 3°C.

Rickettsia failed to survive to the fifth passage when inoculated with the initial dose of virus.

1 ml. of virulent g. pig pad material inoculated into the serous cavities of rabbits weighing 2,000 g. was found to cause the production of about 100 ml. fluid with a titre up to ten times greater than the original material inoculated. This serous fluid is looked upon as a useful source of antigen.

—H. H. SKINNER.

BROOKSBY, J. B. (1948.) Vesicular stomatitis and foot-and-mouth disease differentiation by complement-fixation.—*Proc. Soc. exp. Biol., N.Y.* 67. 254-258. 1240

Type specific complement fixation was obtained with Vallée O, Vallée A and Waldmann C types of F. & M. disease and Indiana and New Jersey types of vesicular stomatitis using infective material from cattle and g. pigs and also, in the case of vesicular stomatitis, from chick embryos. The specific sera were all obtained from g. pigs. No suggestion of cross-fixation was observed with any of the types of either of the viruses. The procedure employed was titration of complement

in presence of the other reagents, the end-point being the dose necessary for 50% haemolysis. This was calculated after readings were obtained of the supernatant of the centrifugalized tubes using a photoelectric absorptiometer. Thirty min. at 37°C. was allowed for fixation of complement and the tubes were held at this temperature for a further period of 80 min. after the addition of the haemolytic system. A clear graphical representation of the results of such tests is given by plotting log. doses of complement against the probit values of haemolysis. The possible advantages of this new method of differentiating these two vesicular diseases are discussed.

—W. M. HENDERSON.

REYES, H. A. (1946.) Diagnostico de la cepa EVF. como virus de la estomatitis vesiculosa. [Diagnosis of EVF. strain as the virus of vesicular stomatitis.]—*Rev. Med. vet., Bogotd.* 15. 57-80. 1241

Material from an epizootic of a vesicular disease of pigs occurring in a district of Colombia in 1943 was submitted to the usual species susceptibility tests in large and small animals for differential diagnosis.

The causal agent was identified as a virus akin to vesicular stomatitis and not F. & M. disease or vesicular exanthema of swine.

R. considers that the demonstration of the natural occurrence of vesicular stomatitis in pigs is exceptional. No cross-immunity tests were carried out.—H. H. SKINNER.

FINZI, G. (1947.) Sur la transmission de la rage par voie linguale et sur la vaccination antirabique curative du chien. [Transmission of rabies by intra-lingual inoculation.]—*Bull. Acad. vét. Fr.* 20. 437-440. 1242

Injection of fixed virus in the tongue musculature is not accompanied by any local reaction and quite large doses can be used. The incubation period is short, averaging 12 days (7-17). Thus this route is especially useful where the virus is contaminated. Vaccination by this route has proved effective and especially useful where infection has occurred over 15 days prior to treatment.—G. V. LAUGIER.

I. ANDERSON, S. G. (1948.) Mucins and Mucoids in relation to influenza virus action. I. Inactivation by RDE and by viruses of the influenza group, of the serum inhibitor of haemagglutination.—*Aust. J. Exp. Biol. Med. Sci.* 26. 347-354. 1243

II. MCCREA, J. F. (1948.) Mucins and mucoids in relation to influenza virus action. II. Isolation and characterization of the serum mucoid inhibitor of heated influenza virus.—*Ibid.* 355-370. 1244

III. BURNET, F. M. (1948.) Mucins and mucoids

in relation to influenza virus action. III. Inhibition of virus haemagglutination by glandular mucins.—*Ibid.* 371-379. 1245

IV. BURNET, F. M. (1948.) Mucins and mucoids in relation to influenza virus action. IV. Inhibition by purified mucoid of infection and haemagglutination with the virus strain WSE.—*Aust. J. Exp. Biol. Med. Sci.* 26. 381-387. [Author's summary copied *verbatim*.] 1246

I. The Francis inhibitor present in normal serum was found to be inactivated both by the receptor-destroying enzyme (RDE) of *Vibrio cholerae*, and by living influenza virus preparations.

RDE was also capable of destroying the factor in human tears which has a high inhibitory effect on haemagglutination by the influenza A strain Melbourne.

II. Working with human and rabbit sera Francis inhibitor was identified as a component of the heat stable mucoprotein fraction. Its inhibitory activity is lost when treated with potassium periodate and proteolytic enzymes. The relationship of Francis inhibitor and non-specific inhibitors is not clear; they have distinct physical and chemical differences, but they may exist together as a protein mucoprotein complex.

III. A variety of glandular secretions, namely mucin from ovarian cysts, pure blood group O substance, and semi-purified mucoid from pseudomucinous ovarian cysts are active inhibitors of haemagglutination by heated influenza B virus and, to a lesser extent, of haemagglutination by other influenza viruses. This activity can be destroyed by RDE of *V. cholerae*, by enzyme action of influenza viruses, and by dilute periodate solutions.—N. WICKHAM.

IV. Haemagglutination by the influenza virus A strain WSE is inhibited to low titre by purified cyst mucoid.

Treatment of the mucoid with small amounts of periodate greatly increases its inhibitory action, both against haemagglutination and against infection in the allantoic cavity.

V. BURNET, F. M. (1948.) Mucins and mucoids in relation to influenza virus action. V. The destruction of "Francis inhibitor" activity in a purified mucoid by virus action.—*Aust. J. Exp. Biol. Med. Sci.* 26. 389-402. 1247

VI. ANDERSON, S. G., BURNET, F. M., DE ST. GROTH, S. F., MCCREA, J. F., & STONE, J. D. (1948.) Mucins and mucoids in relation to influenza virus action. VI. General discussion.—*Ibid.* 403-411. 1248

V. A purified ovarian cyst mucoid was used as source of Francis inhibitor in a study of its inactivation by influenza and related viruses.

VI. This paper correlates the work recorded in the previous papers.—N. WICKHAM.

ANDREEV, K. P. (1940.) [The differential diagnosis of equine encephalomyelitis.]—*Veterinariya, Moscow*. No. 4. pp. 27–39. [French summary.] 1249

The author discusses the various affections which may be confused with equine encephalomyelitis in the U.S.S.R. The first group includes cornstalk disease and the various other intoxications caused by feeding horses with fodder contaminated with the *Aspergillus* species, *Mucor mucedo*, *Penicillium*, etc. The second group results from horses eating poisonous plants such as *Acroptilon picris*, *Sideritis montana*, *Aristolochia clematitis*, *Artemisia tauris*, ragwort, horsetail, henbane, buckwheat and thornapple. The third group includes influenza, streptococcal infections, piroplasmiasis, *Babesia* infection and trypanosomiasis.

The importance of very searching investigations into all the facts of each case becomes evident, if prophylaxis and treatment are to be successful.

The author describes an epizootic in the U.S.S.R. of what at first appeared to be equine encephalomyelitis, but which was ultimately diagnosed as hyperplastic cirrhosis of the liver of (undetermined) toxic origin—"Winton Disease".

—I. W. JENNINGS.

AGRINSKIĬ, N. I., & FILATOV, P. V. (1946.) [Liver biopsy in horses.]—*Veterinariya, Moscow*. No. 1. p. 35. 1250

Liver biopsy was carried out on 12 horses with infectious anaemia; no signs of disease of the liver were observed nor of any change in the general condition of the horses. The technique of liver biopsy is described.—J. JONAS.

CURY, R., PENHA, A. M., & D'APICE, M. (1947.) Vacina contra a peste suína técnica de preparo. Fatores que interferem na sua eficiência. Imunização por via intradérmica. [Vaccine against swine fever. Technique of preparation. Factors which interfere with its efficiency. Immunization by intradermal route.]—*Arq. Inst. biol., S. Paulo*. 18. pp. 161–211. [Abst. in English.] 1251

The method of preparing crystal violet vaccine is described, the composition being as follows:—

For Blood Vaccine. Defibrinated infected blood 1,000 ml., glycerin 250 ml., 1.5% phenol in distilled water 100 ml., 0.5% crystal violet 150 ml.

For Tissue Vaccine. Finely ground infected spleen and lymph node pulp 100 ml., 0.75% phenol in distilled water 200 ml., 0.5% crystal violet 30 ml.

Tests are done on pigs to verify the potency

of vaccines. Emphasis is laid on the need for attention to detail when preparing such vaccines and considerable detail is given concerning the various stages. The vaccines give good results when injected intradermally in a dose of 1 ml.

JACOTOT, H. (1947.) La vaccination contre la peste porcine au moyen d'émulsions organiques avirulentes. (3e note.) [Swine fever vaccination with avirulent tissue vaccine.]—*Bull. Acad. vét. Fr.* 20. 354–358. 1252

To formolized tissue vaccines prepared from spleen and/or lymph nodes the latex of *Hevea brasiliensis* (rubber tree) was added in the proportion of one g. latex to ten g. of tissue pulp. The addition of this latex markedly increased and prolonged the protective action of the vaccine.

—D. LUKE.

D'APICE, M., PENHA, A. M., & CURY, R. (1948.) Vaccination against hog cholera with crystal violet vaccine by the intradermic route.—*J. Amer. vet. med. Ass.* 112. 230–233. 1253

The intradermal inoculation of doses of crystal violet vaccine as low as 0.5 ml. gave complete protection against 2 ml. virulent blood after 21 days. After intradermal vaccination immunity was established in 10–15 days. It required 3 ml. of the same vaccine intramuscularly to give complete protection under similar conditions.—D. L.

KAPLAN, M. M., & MERANZE, D. R. (1948.) Porcine virus encephalomyelitis and its possible biological relationship to human poliomyelitis.—*Vet. Med.* 43. 330–341. 1254

This is a useful review of present knowledge of porcine virus encephalomyelitis or Teschen disease which since 1939 has come to be of major economic importance on the continent of Europe.

The lesions of the condition in the pig are said to have a striking similarity to those described for acute anterior poliomyelitis in human beings. The authors consider that while the virus of porcine encephalomyelitis and that of human poliomyelitis are not identical there may be a biological relationship between them.—D. LUKE.

COFFIN, D. L. (1948.) The pathology of so-called acute tonsillitis of dogs in relation to contagious canine hepatitis (Rubarth).—*J. Amer. vet. med. Ass.* 112. 355–362. 1255

Five cases are described which have a syndrome identical with that of hepatitis contagiosa canis (Rubarth) [*V.B.* 18. 369]. The most striking features common to all were a lymphoid reaction, central necrosis of the liver and endothelial damage together with intranuclear inclusion bodies. None were found in the endothelial cells of the stomach and intestine. The central nervous system was not examined. The cause of sudden death is attributed to shock-like

collapse due to hepatic deficiency. The author believes it to be a virus disease widespread in the U.S.A. and speculates on its possible role in producing lymph node pigmentation, cirrhosis of the liver and fibrous thickening of the heart valves, so commonly seen in older dogs.—G. V. LAUGIER.

GROSSO, A. M., & RODRÍGUEZ, A. (1948.) Gastroenteritis infecciosa de los felinos en parques zoológicos. [*Feline infectious gastroenteritis in zoological gardens.*—*Gac. vet., B. Aires.* 10. 51-60. 1256

The most important veterinary problem in the Buenos Aires Zoo is the occurrence of feline gastroenteritis in the large cats, particularly in the jaguars from the age of 5-7 months. The disease has been diagnosed on the course, symptoms and lesions which resemble closely those seen in the domestic cat, and on the fact that susceptible domestic cats exposed to infected cages or injected with diseased material develop the typical disease in 5-7 days. Dogs, on the other hand, are completely immune, and canine distemper serum is useless in treatment.

The animals concerned are the jaguar, puma, ocelot, mountain cat, eyra cat, lynx and lion. (No case has been seen in the tiger as yet.) In these the course is hyperacute except in the puma in which the illness may be prolonged for 2-3 days.

For prophylaxis, the authors use a vaccine prepared from glycerinized and formolized spleen of cats dead of the disease. For curative purposes and for protection before the vaccine has had time to take effect, the authors use citrated blood from a number of adult cats which have presumably survived infection. Owing to the persistence of the virus, all cats entering the zoo must be protected.—I. W. JENNINGS.

DAUBNEY, R., & MANSY, W. (1948.) The occurrence of Newcastle disease in Egypt.—*J. comp. Path.* 58. 189-200. 1257

A severe form of Newcastle disease is responsible for serious losses amongst Egyptian poultry. The Muktesar vaccine strain of virus was used to immunize 30,500 birds on six government breeding farms. The vaccine gave good protection, but post vaccination paralysis was observed, particularly in young chicks. These results are in accordance with those published by HADDOW & IDNANI (1946).—F. D. ASPLIN.

VERGE, J. (1948.) Les pestes aviaires sont-elles transmissibles aux mammifères en général et à l'homme en particulier? [*Is Newcastle disease transmissible to man and other mammals?*—*Rev. Path. Comp.* 48. 475-478. 1258

A review of reported successful artificial transmissions and of naturally occurring Newcastle disease and fowl plague in mammals.—F. D. A.

TOOP, C. R. (1948.) Laryngo-tracheitis.—*J. Agric. W. Aust.* 25. 111-115. 1259

A general description of this disease, which has just been diagnosed in Western Australia for the first time. Evidence indicates that the disease has been present for some years. A quarantine area has been proclaimed to prevent the removal of infected birds to clean districts.—D. C. BLOOD.

GOLUB, O. J. (1948.) Acquired resistance of psittacosis virus to sulfadiazine and effects of chemical antagonists on sulfonamide activity.—*J. Lab. clin. Med.* 33. 1241-1248. [Author's summary copied *verbatim*.] 1260

The 6 BC strain of psittacosis virus, although quite susceptible to the action of sulfadiazine in eggs as shown by reduced mortality, multiplied to a considerable extent in the presence of the drug. Para-aminobenzoic acid was found to be a highly effective antagonist of sulfadiazine with this virus in eggs, and a competitive relationship was suggested. A similar test with the virus of lymphogranuloma venereum did not show any antagonistic effect. Pteroylglutamic acid was found to require considerably higher concentrations for demonstration of complete antagonism against as little as 1 mg. of sulfadiazine, although partial antagonism was demonstrable against 50 mg. of sulfadiazine. By repeated passage of the 6 BC virus in the presence of sulfadiazine, a strain was developed which was completely resistant to 20 mg. of the drug even after ten passages through normal eggs. Concomitant resistance of this strain to sulfathiazole and sulfamerazine was also demonstrated. No morphologic differences between the resistant strain and the parent virus were observed with the electron microscope.

FRANCIS, T., Jr. (1947.) Mechanisms of infection and immunity in virus diseases of man.—*Bact. Rev.* 11. 147-156. 1261

For the purpose of this discussion viruses are divided into four groups:—(1) those in which infection persists but immunity does not: the psittacosis-lymphogranuloma group; (2) those in which immunity persists and the evidence indicates that the virus does not: (a) the acute exanthemata of man and (b) yellow fever and the viruses causing encephalitis in man; (3) those in which neither virus infection nor immunity persists: influenza and the common cold. [Under this heading foot and mouth disease is included, and the author appears to believe that it is a purely local infection and therefore not susceptible to the action of antibodies. He is apparently unaware that a good immunity is produced in this disease and that it can even be produced by dead vaccines.] (4) Those in which both virus infection and

immunity persist independently: various tumours fall into this category.

F. points out that antibodies are effective in virus immunity according to the invasive mechanism involved, the type of parasitism and the availability of antibody at the portal at which virus makes its entrance to the body.—JOHN FRANCIS.

VAN GILSE, P. H. G., & VERLINDE, J. D. (1947.) Rode hond—varkenspest. [Rubella (German measles) of man—swine fever. (Possibility that congenital defects may follow infection of the pregnant dam.)]—*Tijdschr. Diergeneesk.* 72. 695. 1262

Since Gregg's (1941) report on congenital cataract in children following maternal infection with rubella during pregnancy numerous observations have been reported which indicate a connexion between rubella and congenital defects. It is now fairly certain that rubella infection during the first three months of pregnancy may give rise to congenital defects (e.g., cataract, cardiac defects, deaf mutism, etc.). The possibility must also be admitted that other virus diseases early in pregnancy may cause congenital defects in the child. The authors speculate whether congenital defects may occur also in animals, as a result of congenital infection. They quote GRASHUIS (1947) as reporting such an occurrence in piglets following swine fever.—F. E. W.

BROWN, G. C., FRANCIS, T., & AINSLIE, J. (1948.) Studies of the distribution of poliomyelitis virus. V. The virus in familial associates of cases.—*J. exp. Med.* 87. 21–27. [Authors' summary copied *verbatim*.] 1263

The occurrence and duration of the carrier state in familial associates of recognized cases of poliomyelitis was studied by the examination for virus of stool specimens collected from the members of four families at regular intervals for a period of over 2 months. The results indicate that: (1) virus may persist in their stools continuously for 4 to 5 weeks; (2) virus may be encountered intermittently in the stools; (3) in some instances virus may be present for brief periods only; (4) children are more likely to maintain virus than are adults in the same family; (5) infection of a family takes place rapidly, suggesting again simultaneous infection from a common source.

FRANTZEN, A. (1948.) On the preparation of a formalinized aluminium-hydroxide vaccine with the murine S.K. poliomyelitis strain. (Jungeblut & Sanders.)—*Acta path. microbiol. scand.* 25. 351–355. [In English, author's summary copied *verbatim*.] 1264

Jungeblut & Sanders' murine S.K. Poliomyelitis virus was grown in fluid tissue culture

with embryonic mouse brain (after Jungeblut & Sanders).

A vaccine that is not infectious to mice but immunizes them against subsequent infection with the same virus was prepared from the supernatant fluid adsorbed to aluminium hydroxide and treated with 0.1 % formalin at 25° for three days.

PIRIE, N. W. (?1947.) The state of viruses in the infected cell.—*Cold. Spr. Harb. Symp. quant. Biol.* 11. pp. 184–192. [Abst. in *Rev. appl. Mycol.* 27. 219–220. (1948.), copied *verbatim*.] 1265

In this address (given at the Cold Spring Harbor symposium on quantitative biology [? in 1947]) on the properties of viruses as they exist in the cell, the author gives three reasons why it is uncertain whether a virus extract has the same properties as the intracellular virus. These are (a) the preparation may be contaminated with host constituents having properties superficially so similar to those of the virus that the present methods of fractionation fail to separate them, (b) each virus particle may be associated as a complex with constituents of the host not essential for its activity, and (c) fractionation may alter some of the properties of the virus without altering its infectivity. The evidence for the existence of complexes with components of the host tissue is reviewed and the alterations which may occur during isolation are discussed. The author concludes that the visible structures found in infected cells have properties that suggest that part of the virus is present in them in the form of a complex, as otherwise they would not stay out of solution. This interpretation depends on a knowledge of the intrinsic properties of the virus, and there is much evidence to suggest that these are not necessarily the same in the cell and in extracts. There can be no question that a study of the properties of the purified viruses imposes certain limitations on the range of properties that can be legitimately attributed to the same viruses in the cell.

From a utilitarian point of view the accumulation of evidence about the association of virus particles with one another and with other cell constituents is important, since the course followed by an infection may depend as much on these associations as on the rate at which virus can be synthesized in the cell. It may be supposed that some of the effects of the nutritional state of the host, and of the introduction of simple substances into the host, on the manifestations of a virus disease may result from the changing chemical environment affecting the state of attachment of the virus.

The stability of a virus and presumably the likelihood that it will undergo variation or mutation

must depend on its state of chemical combination between the time of its synthesis and the establishment of infection in another cell.

CUTTING, W. C., HALPERN, R. M., JENKINS, D. W., TRIPI, H. B., DREISBACH, R. H., IRWIN, A. E., & PROESCHOR, F. (1947.) **Chemotherapy of virus infections.**—*J. Immunol.* 57. 379-390. 1266

The literature is reviewed on the attempted chemotherapy of virus infections. The authors used the following strains in their own investigations: herpes simplex, vaccinia and influenza. Experiments were carried out in chick embryos or mice. Tests of some 200 compounds gave largely negative results, but deficiency of thiamine or excess of riboflavin appeared to offer slight protection in mice infected with herpes simplex virus. Certain compounds which could be regarded as synthetic modifications of nucleic acid derivatives slightly lengthened the lives of chick embryos infected with vaccinia virus.—JOHN FRANCIS.

DE ST. GROTH, S. F. (1948.) **Regeneration of virus receptors in mouse lungs after artificial destruction.**—*Aust. J. exp. Biol. med. Sci.* 23. 271-285. 1267

When introduced into mouse lung by inhalation or intranasal instillation, the receptor destroying enzyme (R.D.E.) of *Vibrio cholerae* destroys the receptors for influenza virus. These receptors will regenerate, commencing from about six hours after the destructive agent has been eliminated, and regain their normal level in approximately six days.

Administration of anti R.D.E. serum stops the action of R.D.E. and allows regeneration to begin earlier. Continuous treatment with R.D.E. (14 consecutive days) does not exhaust the capacity of the receptors to regenerate.—N. WICKHAM.

PARKER, R. R., BELL, E. J., & LACKMAN, D. B. (1948.) **Experimental studies of Q fever in cattle. I. Observations on four heifers and two milk cows.**—*Amer. J. Hyg.* 48. 191-206. [Authors' summary slightly modified.] 1268

Four heifers were inoculated with Q fever (employing either yolk-sac cultures of *Coxiella* [*Rickettsia*] *burneti* or suspensions of infected guinea-pig-spleen tissue) by the following routes, respectively: intranasal, intravenous, digestive tract, and vaginal. The results were apparently negative as judged by (a) negative complement-fixation tests with preinoculation and successive postinoculation blood specimens, and (b) failure to obtain unequivocal evidence of infection in guinea pigs injected with successive postinoculation specimens of blood, nasal washings, feces, and urine (except two early specimens from the heifer

inoculated via the vagina, the urine of this animal quite probably having become contaminated by the inoculum), and in other guinea pigs used to test specimens of 21 tissues from one of the heifers sacrificed 26 days after inoculation, and of 23 tissues from another sacrificed on the thirty-third day.

The findings through the forty-eighth day are reported for two milk cows inoculated via the udder, each inoculated quarter receiving approximately 5,000,000 guinea-pig-infectious doses of yolk-sac-culture material. The udder of one cow was inoculated in 3 quarters (one via the lactiferous duct, one via the mammary gland, and the third subcutaneously). The udder of the second cow was inoculated only in one quarter; this via the lactiferous duct. In the former cow, milk from the quarter inoculated via the lactiferous duct was infectious for guinea pigs for 17 days, that from the quarter inoculated via the mammary gland for at least 48 days, while milk from the quarter inoculated subcutaneously remained noninfectious. In the latter cow, the milk from the one inoculated quarter (via lactiferous duct) was also infectious for at least 48 days. In neither cow was milk infectious from an uninoculated quarter. Frequent tests of blood, nasal washings, urine, and feces were also negative. However, the establishment of infection in both cows is indicated by (a) the complement-fixation test which was negative with preinoculation blood and positive in increasing titer for successive postinoculation specimens, and (b) the long period during which milk remained infectious. Observations on these cows are being continued.

Brief mention is made of a third milk cow, inoculated via the uterus, on which observations have not been made for a sufficient period to be reported in detail. The urine of this cow was infectious from the second through the eighth day, presumably because of contamination by the inoculum. The milk from one quarter became infectious on the sixth day. Q fever antibodies appeared in the blood of this cow on the ninth day and in increasing titer in subsequent samples. However, it is not apparent whether udder infection resulted from the original inoculation via the uterus or from contamination of one of the teats from contact with the bedding on the floor wet with infectious urine.

The need is apparent for research studies to determine, first, how cattle become infected from nature, and second, how infection is spread within a dairy herd once it has been introduced.

STRAUSS, E., & SULKIN, S. E. (1948.) **Studies on Q fever: complement-fixing antibodies in meat packers at Fort Worth, Texas.**—*Proc. Soc. exp. Biol., N.Y.* 67. 139-141. 1269

The authors performed complement fixation tests on the sera of 1,433 packing house workers, who were accustomed to handling meat or meat products, either raw or prepared. The antigen used was a washed suspension of *Rickettsia burneti* from egg-yolk sac. Evidence of previous infection with *R. burneti* was obtained in 8% of the sera, in which the antibody titre was 1:8 or over. It was found that there was no relationship between serum reactivity with antigen for syphilis and that for Q fever. There was some suggestive evidence that workers engaged in handling beef had higher titres than those handling pork or mutton. There are as yet no figures for comparison with the incidence of Q fever titres in other geographical

See also abstr. 1320 (encephalomyelitis of mice).

areas or other occupational groups in the U.S.A.

—I. W. JENNINGS.

SOUTHCOTT, R. V. (1947.) **Observations on the epidemiology of tsutsugamushi disease in North Queensland.**—*Med. J. Aust.* Oct. 11th. 441-450. 1270

The epidemiology of this disease of man, known also as scrub typhus, mite typhus, K typhus, etc., is discussed in detail and there is a detailed description of an outbreak following military exercise. The possibilities of birds and reptiles acting as reservoir hosts and the former serving to spread the disease over long distances are discussed, but were not fully investigated.

—H. McL. GORDON.

IMMUNITY

KENT, J. F., BUKANTZ, S. C., & REIN, C. R. (1946.) **Studies in complement fixation. I. Spectrophotometric titration of complement; construction of graphs for direct determination of the 50 per cent hemolytic unit.**—*J. Immunol.* 53. 37-50. 1271

Attention is drawn to the desirability of using 50% haemolysis as an end-point in complement fixation procedures. The standardization of reagents is described and a spectrophotometric method for complement titration is used. A method is described for constructing graphs to determine the 50% haemolytic unit of complement, from the percentages of haemolysis observed in the titration.—G. FULTON ROBERTS.

JENKINS, C. E. (1946.) **The release of antibody by sensitized antigens.**—*Brit. J. exp. Path.* 27. 111-121. 1272

Motile *B. typhosus* suspensions were treated with high titre homologous antiserum in excess, between 0° and 10°C. The supernatant serum was then removed, and the agglutinate washed in 0.02% cold saline. On replacing with normal saline and raising the temperature to 56°C., some of the flagellar antibody is released from the union. The process may be repeated with fresh antiserum using the same antigen. The yield of antibody judged by titre is nearly a quarter of the original antiserum employed, though it is greater if alcoholized suspensions of bacilli are used. Alcoholized bacilli are capable of absorbing the specific antibody. The somatic agglutinin is not recovered. The released antibody is specific, but differs in some other respects from that in the original antiserum.—G. FULTON ROBERTS.

I. HEIDELBERGER, M., TREFFERS, H. P., & MAYER, M. (1940.) **A quantitative theory of the precipitin reaction. VII. The egg albumin-**

antibody reaction in antisera from the rabbit and horse.—*J. exp. Med.* 71. 271-282. 1273

II. HEIDELBERGER, M. (1947.) **Antiproteins in horse sera. II. Antibodies to pneumococcus nucleoprotein and their reaction with antigen.**—*Ibid.* 86. 77-81. 1274

III & IV. TREFFERS, H. P., HEIDELBERGER, M., & FREUND, J. (1947.) **Antiproteins in horse sera. III. Antibodies to rabbit serum albumin and their reaction with antigen. IV. Antibodies to rabbit serum globulin and their interaction with antigen.**—*Ibid.* 83-94; & 95-106. 1275

[Summaries copied *verbatim*.]

[The authors state, in a footnote to II, that I is the first paper of this series although not numbered as such at that time.]

I. In two rabbits subjected to prolonged injections with crystalline egg albumin the antibodies in one showed progressive changes such as noted in an earlier paper; the antibodies in the other did not.

The significance of this behavior in the production of sera for therapeutic use is pointed out.

Quantitative studies are reported on the low grade or incomplete antibody present in the early stages of immunization of a horse with egg albumin.

Quantitative studies on the flocculating antibody from later bleedings from the horse are given, and the dissociation of the soluble pre-zone compounds by rabbit anti-egg albumin is studied. Rough velocity estimations are reported.

The bearing of the findings on the mechanism of precipitin and flocculation reactions and of the Danysz effect is discussed in terms of the union of multivalent antigen with multivalent antibody.

II. The antiprotein in an antipneumococcus horse serum resulting from intravenous injections

of infected pleural exudate showed a precipitin type of reaction with pneumococcus nucleoprotein rather than the antitoxin type of response.

III. Two horses were injected subcutaneously with alum-precipitated rabbit serum albumin. The resulting antibody resembled diphtheria antitoxin and anti-egg albumin in the horse in giving a sharp zone of flocculation with antigen, in being water-soluble, in reactivity toward an anti-antibody rabbit serum, and in its electrophoretic properties. The effect of continued immunization, and of variation in volume and temperature on the reactivity of the antibody are discussed. Intravenous injection of the same antigen into horses did not give rise to detectable amounts of antibody of the same type.

IV. The intravenous injection of two horses with alum-precipitated rabbit serum globulin resulted in the production of antibody which gave a typical precipitin reaction without a prezone in the region of antibody excess. The chemical, physical, and serological properties of this antibody are comparable to those of the more familiar anticarbohydrate antibodies. The subcutaneous injection of horses with the globulin antigen gave rise to low grade "univalent" antibody which did not precipitate with soluble antigen. The low grade antibody could be removed from solution by attachment to preformed specific precipitates, or by coprecipitation in the presence of "multivalent" precipitating antibody.

It is concluded that the familiar antitoxin type of antibody is not the only form of anti-protein response in horses but that precipitating and low grade non-precipitating antibodies may also be formed. The nature of the antigen and the route of injection are demonstrated to be important factors in determining the characteristics of the antibody formed.

PILLEMER, L. (1946.) **The immunochemistry of toxins and toxoids. I. The solubility and precipitation of tetanal toxin and toxoid in methanol-water mixtures under controlled conditions of pH, ionic strength and temperature.**—*J. Immunol.* 53. 237-250. 1276

Methods for biological assay of tetanal toxin and toxoid are given. The optimal points of pH, ionic strength and temperature for precipitation of these substances in methanol-water mixtures are determined. Both are best precipitated in 40% methanol at ionic strength of 0.09 at a temperature of -5°C .; the toxin at pH 5.1 and the toxoid at pH 4.8-4.9. The purified products had an Lf concentration of 300-400 times over the crude preparation. A similar increase in the MLD of the purified toxin was obtained. The purified toxoid was free from sensitizing material as judged by anaphylactic studies.—G. F. ROBERTS.

I. WOLFE, H. R., & DILKS, E. (1946.) **Precipitin-production in chickens. II. Studies on the in vitro rise of the interfacial titres and the formation of precipitins. II. (1948.) III. The variation in the antibody response as correlated with the age of the animal.**—*J. Immunol.* 52. 331-341; & 58. 245-250. 1277

I. In a previous paper [see *V. B.* 13. 54.] W. showed that chickens produce precipitins of very high titre against mammalian sera, as judged by the interfacial ring test. It was also shown that such antisera spontaneously increase in titre *in vitro* on standing for up to 12 days after bleeding. These phenomena were further studied.

Adult male chickens of various breeds were immunized by intravenous injection against serum proteins from cattle, buffalo, sheep, horse, dog, goat or man. Three injections on alternate days comprised the initial course, the total dose varying from 1-3 ml. A month or more later, two injections on alternate days totalling 0.75 to 1.5 ml. were administered. The interfacial test was used in the titrations; doubling dilutions of the antigen in 1.8% saline solution were employed. The chickens were bled from the heart 8-10 days after the last injection, and the serum was maintained either frozen or in a cold room (42°F .). Titrations were performed at intervals from three hours to 14 days after bleeding.

The results showed that the *in vitro* rise in titre was most marked between 24 hours and five days after bleeding. The titre reached maximum by eight days and had maintained this level after six months. The results were similar whether the chickens had received one or more series of injections.

The precipitin response in chickens after one or more courses of immunization was also studied. The results conform to the general observations that second and subsequent courses of immunization result in a quick response, a higher titre and a slower disappearance of the antibody than is found after the primary stimulus. The response of the chicken is rapid, as high-titred antisera were found between three and six days after the last injection.

A negative phase could be induced by re-injections of the homologous antigen.

II. By using methods previously described, the authors studied precipitin production in chickens of all ages, from one day to 12 weeks old. The antigen used was bovine serum. Slightly more than one-half of the chicks in the first week of life failed to show any precipitin, and those that responded gave only low titres. The ability to produce antibody increased gradually up to four weeks of age. A marked increase in titre was observed between the fourth and fifth weeks of

life, and thereafter no significant change was noticed up to 12 weeks. It was concluded that very young chicks have not acquired full power of antibody production, which conforms to the evidence relating to other species, and that serological maturity is reached by the chicken at five weeks of age.—G. FULTON ROBERTS.

LEMÉTAYER, E., NICOL, L., GIRARD, O., & CORVAZIER, R. (1947.) Vitesse d'apparition des antitoxines spécifiques chez les poulains après ingestion de colostrum de juments immunisées au moyen de l'antigène diphtérique ou tétanique. [Transfer of antibodies by the colostrum in foals.]—*Bull. Acad. vét. Fr.* 20. 457-460. 1278

The strength and time of appearance of antibodies transferred to new-born foals by the colostrum from mares immunized against tetanus and diphtheria, were studied in nine experiments. In each case the foal was muzzled at birth so that the time (and in some cases the quantity) of colostrum which was taken, could be controlled. The titre of antibody both in the colostrum and in the foal's serum were estimated at birth, and the latter was measured again at intervals for a further 24 hours.

The results indicated that even small quantities of colostrum caused the foal's antibody titre to increase within 45 min. of administration, the maximum being reached in three hours. Absorption of antibody was also rapid when the antiserum was ingested alone, but was quicker when the antiserum was mixed with antibody-free colostrum before ingestion.—G. FULTON ROBERTS.

LEMÉTAYER, E., NICOL, L., JACOB, L., GIRARD, O., & CORVAZIER, R. (1948.) Recherches sur le passage des antigènes à travers le placenta. [Transplacental transference of antigens.]—*C. R. Soc. Biol. Paris.* 142. 908-909. 1279

Two mares were immunized by one injection against tetanus, towards the end of pregnancy. After parturition the mares were given a second injection and, simultaneously, the foals received their first; the antibody titres of the mares and the foals were estimated before, and ten days after this injection. There was no antibody response in the foals though the mares responded normally as to a secondary stimulus. It is concluded that the single injection acted as a primary stimulus to the foals and that, therefore, the antigen immunizing the mare had not crossed the placenta *in utero*.—G. FULTON ROBERTS.

BAIN, W. A., HELLIER, F. F., & WARIN, R. P. (1948.) Some aspects of the action of histamine antagonists.—*Lancet.* 255. 964-969. [Authors' summary copied *verbatim*.] 1280

The quantitative modification of the intra-

dermal histamine reaction by the oral administration of the antihistamine drugs 'Benadryl,' 'Anthisan' ('Neoantergan'), and 3277 R.P. is described.

These drugs differ in their weight-for-weight effectiveness and in their duration of action, benadryl being classed as relatively weak and short-acting, and anthisan and 3277 R.P. as potent and long-acting.

There was considerable variation from one person to another in the degree and duration of the specific antihistamine response to the drugs and in the incidence of side-effects. If the specific response to one drug was poor it was usually poor to the others also.

In people resistant to any of the antihistamine drugs a "normal" response could be obtained by a suitable increase in the dose, the chief limiting factor being the incidence of unpleasant side-effects.

In 20 patients with chronic urticaria treated with anthisan, in all of whom the weals were suppressed or greatly modified, intradermal histamine reactions were recorded before and throughout treatment, and the modification of the reaction was found to parallel closely the response of the urticaria.

There was considerable variation from one person to another in the dose required to suppress the urticaria, and it is suggested that many of the reported failures in the treatment of urticaria with anti-histamine drugs were in patients resistant to the drugs, and that higher doses or more potent drugs might have produced satisfactory effects.

The results are discussed, with special reference to the importance of the differences in potency and duration of action of the different drugs and to the variation from one person to another in the response to any one. A possible factor in determining differences in duration of action is noted, and the significance of the variation in response from one person to another is emphasised.

BROOKSBY, J. B. (1947.) The serum proteins of the domestic animals.—*Proc. R. Soc. Med.* 40. 187-189. 1281

Comparisons of the results obtained by different workers are difficult because of variations in technique and differences of age and nutrition of the animals. The results obtained by Svenson with the electrophoretic method in the horse, ox, pig, sheep, rabbit and g. pig are given and these are compared with results obtained by the salting-out method. B.'s findings indicated that the antibody to the foot and mouth disease virus was associated with γ -globulin of the blood serum.

—JOHN FRANCIS.

MCCARTY, M. (1947.) The occurrence during acute infections of a protein not normally present in the blood. IV. Crystallization of the C-reactive protein.—*J. exp. Med.* 85. 491-498. 1282

During some acute infections the appearance in the serum of a protein reacting with the C somatic antigen of the pneumococcus is noticed. It is no longer present after the acute stage has subsided. It appears to be associated with the albumin fraction of the serum.

A procedure for obtaining this protein in crystalline form is described. The crystals are subjected to a study of their chemical and antigenic properties.—G. FULTON ROBERTS.

BRUNER, D. W., HULL, F. E., EDWARDS, P. R., & DOLL, E. R. (1948.) Icteric foals.—*J. Amer. vet. med. Ass.* 112. 440-441. 1283

Following six cases of haemolytic jaundice in new-born foals, the authors found that in each case the serum of the mare agglutinated the red cells of the stallion, but that the serum of the stallion did not agglutinate the cells of the mare. The cells of one of the foals which recovered were agglutinated by the serum of its dam, but not by the serum of its sire. Sera from 40 other mares failed to agglutinate the cells of the stallions which sired the affected foals. The antisera from the mares agglutinated 75 % of 80 samples of stallions' red cells, but the reactions were not similar with each serum. Attention is drawn to the danger of transfusing an icteric foal with the blood of its dam. A donor is suitable only when the red cells are not agglutinated by the serum of the recipient [or by that of its dam]. The risk of the dam's milk harming the foal is mentioned.—G. F. R.

See also absts. 1163 (BCG vaccine); 1170-1172 (tuberculin sensitivity); 1174 (Johne's disease); 1180 (pasteurellosis); 1190 (haemagglutination by coliform organism); 1195 (brucellosis); 1209 (pleuro-pneumonia of goats); 1225 (trichomoniasis); 1235-1240 (foot and mouth disease); 1251-1253 (swine fever); 1261 (virus diseases); 1264 (poliomyelitis); 1298 (tick paralysis); 1303 (hookworms in dogs).

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

REYES, R. V. (1948.) Artrópodos de interés médico-veterinario comprobados en Colombia. [Arthropods of veterinary interest confirmed in Colombia.].—*Rev. Med. vet., Bogotá.* 17. 66-80. 1286

This is largely a check list of parasites, comprising 12 pages of the article. Thirty-four references are given.

HACKMAN, R. H. (1947.) The persistence of DDT on cattle.—*J. Coun. sci. industr. Res. Aust.* 20. 56-65. 1287

The most important factor causing the removal of D.D.T. from cattle sprayed with the compound in a variety of preparations is licking, either by the animal concerned or by other animals in the herd. Other factors such as solar radiation and rain, growth and shedding of hair,

DARRASPEN, E., & GODFRAIN, J.-C. (1947.) L'Étiologie et la thérapeutique de l'ictère des muletons nouveau-nés doivent-elles être révisées? [Need for revision of the aetiology and therapeutics of jaundice in new-born mules.].—*Rev. Med. vét. Lyon et Toulouse.* 98. 268-274. 1284

A short account of the part played by rhesus factors in haemolytic disease of the new-born infant is followed by an appreciation of the work of CAROLI and BESSIS [*V. B.* 18. 81.] in demonstrating a similar cause for jaundice in new-born mules. It is thought that the infective theory of causation has been superseded by the demonstration of a blood group incompatibility. Agglutinins against the red cells of the mule and the donkey have been demonstrated in the serum and the milk of the mare, and the serum of the mule. The treatment is briefly considered.—G. F. R.

EYQUEM, A. (1948.) L'atteinte du système nerveux central chez les jeunes animaux présentant une maladie hémolytique expérimentale. [Central nervous system disorders in haemolytic disease in newborn animals.].—*C.R. Soc. Biol. Paris.* 142/ 585-587. 1285

Rabbits were immunized against the red cells of dogs and cats, and the sera thus prepared were administered orally or by injection into new-born puppies and kittens respectively. A syndrome typical of haemolytic jaundice ensued and, in some of the young animals, was accompanied by convulsions, vertigo and opisthotonos. These animals were killed and the macroscopic and histological lesions in the central nervous system were essentially similar to those seen in kernicterus in the newborn human infant.—G. F. R.

rubbing, production of skin secretions, absorption into the skin and hair and flaking of the epithelium appear to play a minor part. It is concluded that the amount of D.D.T. ingested by licking is not sufficient to produce toxic effects.

The composition of the emulsions used did not appear to influence the period of persistence. Increasing the concentration of D.D.T. from 1 to 2 % produced but a very small increase in the persistence period. The methods of estimation of D.D.T. are briefly described.—H. MCL. GORDON.

STEINER, G. (1945.) Fallenversuche zur Kennzeichnung des Verhaltens von Schmeissfliegen gegenüber verschiedenen Merkmalen ihrer Umgebung. [Bait-trap tests to determine the reaction of blowflies to various characteristics of their environment.] pp. 87. Darmstadt,

Zool. Inst. Tech. Hochsch. [Abst. from Rev. appl. Ent. Ser. B. 36. 25. (1948).] 1288

A detailed account of laboratory tests in Germany on the reactions of blowflies to olfactory and visual stimuli. The flies used were inbred, sexually mature adults of *Phormia regina*. It was found that, whereas in the smaller cages used males were more attracted to light than were females, in the larger ones the traps nearest the light attracted more females than males. When half the number of bait-traps in the smaller cages were painted black, the darker ones were far less attractive than the others, but the difference in their attractiveness was less marked for females than for males.

The optical reactions of the flies were further studied by tests of the relative attractiveness of glossy paper chequered in black and white squares of sizes varying from 1.25 to 20 mm. In field tests baits surrounded by black and white patterns were more attractive to *Calliphora* than those that were not.

The attractiveness of ethyl amine in different concentrations was tested. It was found that odours that were originally strongly repellent became less so as the flies became accustomed to them.

HUGHES, L. E., POLLARD, E. P., FIELD, H. I., & JONES, J. M. (1947.) **The control of the sheep blowfly with D.D.T. and benzene hexachloride (666).**—*Vet. J.* 103. 265-273. 1289

The authors report the results of a series of field dipping trials to control the sheep blowfly *Lucilia sericata*. The trials were carried out on eight farms in mid Wales during the summer of 1946 and involved 3,000 sheep and lambs. Three insecticides were used in the trials, namely a dispersable D.D.T. powder diluted to give a bath concentration of 0.5% D.D.T., a dispersable benzene hexachloride powder diluted to give a bath concentration of 0.5% of total benzene hexachloride and 0.0625% of the γ -isomer, and a commercial arsenic sulphur powder dip, diluted to conform to the statutory requirements of the Sheep Scab Order. The animals were immersed in the bath in each case for approximately 20 sec.

Of the three preparations D.D.T. was much superior in both the degree and duration of protection afforded. Of the sheep dipped in D.D.T., 0.5% were struck, in benzene hexachloride 6.6% and in arsenic 8.1%. The mean time for first strike in each group was D.D.T. 40.9 days, benzene hexachloride 16.4 days and arsenic 26.5 days. The average duration of protection was D.D.T. 42.3 days, benzene hexachloride 30.4 days and arsenic 30.2 days.—W. MOORE.

SHANAHAN, G. J. (1946.) **The toxicity of "666" to prepupae of *Lucilia cuprina*.**—*J.*

Aust. Inst. agric. Sci. 12. 148-149. 1290

The contact effect of "666" (benzene hexachloride, 13% γ -isomer content) was tested by placing prepupae in contact with wool which had been steeped in emulsions (0.1-0.5%) and air dried for ten days. A high percentage of the prepupae failed to complete development, indicating the high contact toxicity of the insecticide.

—H. McL. GORDON.

RAINEY, J. W. (1948.) **Equine mortality due to *Gastrophilus* larvae (stomach bots).**—*Aust. Vet. J.* 24. 116-119. 1291

A number of cases are described from Tasmania and the opinion is expressed that the peritonitis, often gangrenous, which apparently caused death was related to infestation by larvae of *Gastrophilus* spp. The lesions began on areas of the stomach wall overlying localization of larvae, and the peritonitis then spread to other regions. Ulceration initiated by the larvae occurred only at the cardiac end of the stomach.

—H. McL. GORDON.

NORRIS, K. R. (1947.) **The use of DDT for the control of the buffalo fly (*Siphona exigua* (de Meijere)).**—*J. Coun. sci. industr. Res. Aust.* 20. 25-42. 1292

The spraying of half the cattle in a herd resulted in adequate control. It was not necessary to spray the entire body surface, treatment of an area over the shoulders (the chief resting place of the flies) being sufficient. When all of the cattle in a herd are thoroughly sprayed over the shoulders with a 4% emulsion or with a proprietary suspension, "rucide", containing 0.5% D.D.T., they remain free from buffalo flies for two weeks. Dairy cows were kept relatively free by lightly spraying with kerosene emulsions of D.D.T. applied as a fine mist spray which did not leave much residual toxicity.

Large numbers of cattle dipped or sprayed over the entire body surface with D.D.T. preparations for control of *Boophilus microplus* remained virtually free from *S. exigua* for at least five weeks. It appeared that treatment resulted in complete disappearance of the fly from the large areas grazed by the cattle and that re-infestation took place by infiltration of flies from neighbouring areas. On small properties re-infestation took place much more rapidly. Factors affecting the persistency of D.D.T. on cattle are discussed and a bio-assay test for clipped hair samples is described. Methods employed in carrying out large-scale dipping and spraying trials are described.

—H. McL. GORDON.

ANON. (1948.) **Mosquito eradication schemes.**—*Lancet.* 254. 563. 1293

Previously, the "control" of mosquito

vectors of disease consisted in merely keeping the numbers of dangerous species below a critical level. But the campaign for total eradication in Brazil of *Anopheles gambiae*, the African malarial vector, using D.D.T. proved very successful. *A. gambiae* was an invader from tropical Africa, but in Cyprus and Sardinia, where eradication operations are now proceeding, the malarial vectors, *A. sacharovi*, *A. superpictus* and *A. claviger* are indigenous. Total eradication demands continuous work at high pressure until a successful conclusion is reached, in perhaps two or three seasons.

—BERYL A. THURSTON.

WILLIS, E. R. (1947.) **The olfactory responses of female mosquitoes.**—*J. econ. Ent.* 40. 769–778. 1294

A modification of the Hoskins olfactometer was used. Two similar streams of air at a temperature of $34^{\circ}\text{C.} \pm 0.6^{\circ}\text{C.}$ and a R.H. of 75–85%, one carrying the odour to be tested and one blank, were presented to 50 non blood-fed mosquitoes. Attraction of the mosquitoes to the streams was recorded photographically at one-minute intervals. Data are presented which indicate that the females of *Aedes aegypti* and *Anopheles quadrimaculatus* are attracted to the odour of a human arm, but not to carbon dioxide at concentrations of 1, 10 or 50% in air.—B. A. T.

MACLEOD, J. (1948.) **The distribution and dynamics of ked populations, *Melophagus ovinus* Linn.**—*Parasitology*. 39. 61–68. 1295

Methods of assessing adult and pupal ked populations are described. The throat appears to be a breeding area. Infestation reaches its maximum in April and May, and possible reasons for its subsequent decline, with its bearing on control methods, are discussed.—G. B. S. HEATH.

CAMPBELL, J. A. (1946.) **Hatching of the egg of *Ixodes ricinus* L.** [Correspondence.]—*Nature, Lond.* 157. 412. 1296

This paper records findings which differ from certain of Arthur's [(1945). *Nature*. 156. 588.] observations on the hatching of *Ixodes ricinus*. It is suggested that Arthur underestimated the time elapsing between oviposition and appearance of the white structure formed by accumulation of excretory material at the junction of the Malpighian tubules with the gut. C. also considers that the reflexion of the larval head noted by Arthur was an abnormality due to the low relative humidity (80%) in which the eggs were hatched.

—G. B. S. HEATH.

HITCHCOCK, J. F., & MACKERRAS, I. M. (1947.) **The use of DDT in dips to control cattle tick.**

—*J. Coun. sci. industr. Res. Aust.* 20. 48–55. 1297

Field trials are described in which control of *Boophilus microplus* was attained with dips containing 0.5% D.D.T. in a water-miscible preparation ("rucide"). Residual toxicity persisted for 7–14 days, during which time the cattle appeared to act as poisoned baits clearing the pastures of larval ticks.

The spread of arsenic-resistant ticks is mentioned and the three separate phases in control of cattle tick in Queensland are discussed. These phases are, (1) control on grazing and dairying properties where the aim is not eradication but reduction of the population below levels capable of causing "tick worry", while permitting enough ticks to survive to ensure transmission of piroplasmiasis to cattle and so to maintain their immunity, (2) cleansing of cattle for movement from infested to clean country, and (3) reclaiming infested regions by a campaign of eradication.

The preparation of the dips and conduct of the field trials involving over two thousand cattle are described.

The results are discussed under headings of effect on cattle—the blandness of D.D.T. dipping contrasted markedly with irritation and general disturbance following arsenical dipping—the kill of ticks, protective period, interval between dippings, stability of D.D.T. suspensions and the practicability of their use.—H. McL. GORDON.

OXER, D. T. (1948.) **The preparation of canine anti-tick serum.**—*Aust. vet. J.* 24. 95–96. 1298

The treatment of paralysis of dogs caused by *Ixodes holocyclus* is of considerable importance in coastal regions of eastern Australia. Hyperimmune serum prepared in dogs is of very great value, but supplies are limited and, in general, are reserved for cases of paralysis in children.

Immunization is accomplished in two stages:—(1) basal immunization of dogs by administration of gradually increasing doses of toxin by allowing ticks to engorge for increasing periods and in increasing numbers (details are given). A supply of hyperimmune serum should be available for cases in which toxic effects develop during the course of immunization. (2) Hyperimmunization by weekly applications of increasing numbers of ticks, up to 30 at a time. The blood is collected from the jugular vein under nembutal anaesthesia.

In practice the potency of the serum is not measured, but this may be done by testing its ability to neutralize toxin from the salivary glands of newly engorged ticks. [See also *V. B.* 6. 159, & 13. 358.]—H. McL. GORDON.

PARASITES IN RELATION TO DISEASE [HELMINTHS]

NAGATY, H. F., & EZZAT, M. A. E. (1946.) **On the identity of *Multiceps multiceps* (Leske, 1780), *M. gaigeri* Hall, 1916, and *M. serialis* (Gervais, 1845), with a review of these and similar forms in man and animals.**—*Proc. helminth. Soc. Wash.* 13. 93–44. 1299

The authors review the literature on coenurus cysts in animals and man. They describe three cases from an ibex, an ibex-goat hybrid, and a Sudanese sheep respectively, and conclude that the cysts in each case were identical. The authors fed scolices from the ibex-goat hybrid to a dog and obtained adult tapeworms.

They describe the cysts and tapeworms and comparing their description with Hall's description of *M. multiceps* and *M. gaigeri*, conclude that these two species are one and the same. Several features by which *M. serialis* may be distinguished from other coenuri are mentioned, e.g., a characteristic rounded elevation posterior to the guard on the small hooks.—G. M. URQUHART.

CUSHNIE, G. H., & WHITE, N. C. (1948.) **Seasonal variation in faeces worm-egg counts of sheep.**—*Vet. Rec.* 60. 105–107. 1300

Fifty Blackface ewe hoggs were grazed on leys from Oct. 1946 to Jan. 1947. Subsequently, they were grazed on good hill pasture during the day and gathered into a nine-acre field at night, except when confined to a field for five weeks during lambing.

Weekly egg counts of faecal samples were carried out using a modified McMaster technique, and eggs grouped as "Nematodirus", "Strongyloides", and "other strongyles". Half of the ewes received concentrates daily, but this did not appear to alter egg output.

Peak egg output for all groups was reached in the spring, and was followed by a marked drop during the summer.

The authors conclude that this spring rise in egg-counts is due to increased egg-laying activity, rather than to new infestation, as the weather preceding the rise was very severe, and new infestation was improbable.

They consider that phenothiazine treatment before or during the spring egg-production peak might reduce pasture contamination (i.e., by inhibition of the egg-laying activity of female worms) and lessen the worm burden for the lambs.

—G. M. URQUHART.

AVERA, J. W., YOW, E. M., HARRELL, G. T., & FOWLER, E. B. (1946.) **An attempt by feeding to induce in animals reactivity to *Trichinella spiralis* in the absence of infection.**—*Amer. J. trop. Med.* 26. 125–131. 1301

Following their observation that the inmates

of sanatoria gave a significantly high incidence of positive skin reactions against *Tr. spiralis* antigens, the authors attempted to discover whether this might be caused by the passage of sensitizing antigens through the intestinal wall from meat in which the larvae had been rendered non-infectious by freezing, but in which the proteins had not been denatured by sufficient cooking. Using g. pigs and rabbits, it was found that no skin sensitivity or antibody in the serum appeared as a result of ingesting trichinous meat which had been either left at 60°C. for one hour in an electric hot air sterilizer, or kept for 24 hours at -78°C. Antigens used for testing were obtained from trichina larvae and the flocculation test was used for detecting serum antibody.—J. F. A. SPRENT.

LAWRENCE, J. J. (1948.) **The cultivation of the free-living stages of the hookworm, *Ancylostoma braziliense* de faria, under aseptic conditions.**—*Aust. J. exp. Biol. med. Sci.* 26. 1–8. 1302

Larvae of *A. braziliense* developed to the third stage in suspensions of living bacteria, but did not do so in suspensions of dead bacteria, killed either by heat, ultra-violet light or acetone. Larvae did not develop in filtrates of bacterial cultures, with or without nutrient broth and yeast and yeast extract. Larvae reached the third stage under sterile conditions in a medium of fresh rabbit tissue and water agar, a medium which was improved to some extent by the addition of liver extract and ground, killed yeast. The most important constituent in the medium was a heat stable, water insoluble factor present in kidney and veal; though a heat stable, water soluble factor found in kidney or veal infusion is also necessary for good results. None of the media which permitted aseptic cultivation gave as satisfactory results as those in which living bacteria were present.—H. McL. GORDON.

OTTO, G. F. (1948.) **Immunity against canine hookworm disease.**—*Vet. Med.* 43. 180–191. 1303

The author reviews the studies leading up to the discovery that immunity against the canine hookworm, *Ancylostoma caninum* develops as a result of successive reinfection. He points out that it is a quantitative and not an absolute immunity, its degree partly depending on the intensity of the immunizing infection and its effect being relative to the intensity of the challenging infection. The detrimental effect of immune serum on the infectivity of larvae and the occurrence of precipitate at their orifices, has suggested that the serum contains larvicidal antibodies, although their presence was not conclusively

proved by passive transfer of immunity to normal dogs.

Studies on the inflammatory reaction accompanying larval penetration in normal and immune animals has indicated that immunity operates through the agency of both humoral and cellular mechanisms, acting both on the penetrating larvae which are immobilized and engulfed, and on the adult worms in the act of bloodsucking. Allergic manifestations indicate that hypersensitivity often accompanies immunization.

Explaining the incidence of chronic worm infestation in spite of the apparently efficient immune mechanism, Otto points out the detrimental effect of malnutrition on the development of immunity and the relative inefficiency of the immune response in young animals. The review ends with an account of the failure to immunize by artificial means and of the sanitary and nutritional measures which should, in the light of the above studies, help to control canine ancylostomiasis.—J. F. A. SPRENT.

MAYHEW, R. L. (1947.) **Creeping eruption caused by the larvae of the cattle hookworm *Bunostomum phlebotomum*.**—*Proc. Soc. exp. Biol., N.Y.* **66.** 12-14. 1304

Following the handling of material containing the third stage larvae of *Bunostomum phlebotomum*, M. observed that lesions developed between the fingers, which he attributes to the penetration of the larvae. The duration of swelling and irritation was 1-3 weeks.—J. F. A. SPRENT.

DACORSO, P., Filho. (1944.) **Encefalite por microfilaria em cão. [A case of encephalitis in the dog due to *Dirofilaria immitis* infection.]**—*Bol. Soc. brasil. Med. vet.* **13.** 211-217. [English summary.] 1305

The incidence of *D. immitis* infection in dogs is discussed, it being pointed out that in Japan and China it has been placed at 50-70% and in some states of the U.S.A. at 33-66%, whilst at the Brazilian Institute of Animal Pathology the infection rate has been 3%.

A case is recorded in which the dog had symptoms of rabies; an inoculation test into "susceptible animals" yielded a negative result, and no Negri bodies could be detected. Sections of the brain showed discrete, non-purulent encephalitis with numerous intravascular larvae of the worm. In the cerebellum there was perivascular infiltration with lymphocytes and mononuclear cells in both the grey and white matter, the infiltration affecting the vessel walls and the spaces of Virchow-Robin, but not extending into neighbouring tissue. Larvae could be detected occupying all the lumen of the capillaries, the majority appearing as fragments. No evidence

could be detected of inflammation of the meninges, but larvae were present in the vessels in large numbers, and were identified as *D. immitis* by their size, being 0.18 mm. to 0.2 mm. in length.

—U. F. RICHARDSON.

COWIE, D. B., LAWTON, A. H., NESS, A. T., BRADY, F. J., & OGDEN, G. E. (1945.) **Localization of radioactive antimony following multiple daily injections to a dog infected with *Dirofilaria immitis*.**—*J. Wash. Acad. Sci.* **35.** 192-195. 1306

Using radioactive antimony the concentration of antimony in the blood and tissues of dogs was estimated after intravenous injection of sodium antimonyl xylitol. After a single injection there was a rapid decrease of the element in the blood during the first hour after injection followed by slow removal for the next 4-16 hours. Repeated injections, however, resulted in continuous accumulation of the antimony in the blood and a dosage rate of 0.8 mg. per kg. exceeds the clearance rate. It appears that a certain threshold of antimony is necessary before therapeutic results can be obtained.

After single injections of tartar emetic, sodium antimonyl xylitol or antimony trioxide the liver contained the highest concentration of antimony, the thyroid and parathyroid glands the next highest, and the adult *D. immitis* worms the next. After 12 injections of sodium antimonyl xylitol the thyroid gland contained the highest concentrations, the liver ranked second, and the adult worms third. —M. C.

SHARMA, G. K., HUSSAIN, A. (1946.) **A note on guinea-worm infection in dogs.**—*Indian J. vet. Sci.* **16.** 31-32. 1307

Two cases of *Filaria medinensis* infestation at Lahore are described. In the first, two specimens of adult worms worked their way through the skin and were removed, and in the second one worm was seen.—F. C. MINETT.

ROGERS, W. P. (1948.) **The respiratory metabolism of parasite nematodes.**—*Parasitology.* **39.** 105-109. 1308

R. studied the respiratory quotients of various stages of several species of nematode by the Barcroft-Warburg technique.

He observed a variation in oxygen uptake with different species which was not eliminated when calculated on a surface area basis. Except for *Ascaridia galli*, the R. Q. of which was 0.95, the R. Q. of the adult worms examined, *Neoalectana glaseri*, *Nematodirus* spp. and *Nippostrongylus muris*, was 0.6-0.7. The effect of increasing the oxygen tension had little effect on the oxygen uptake and R. Q., except in the case of *A. galli*, in which a slight decrease in the R. Q. occurred.

Infective larvae of *Haemonchus contortus*, *N. muris* and *A. glaseri*, which contain reserve fat, had an R. Q. of 0.72 and the eggs of *H. contortus* an R. Q. of 0.6.—J. F. A. SPRENT.

ROGERS, W. P. (1948.) **The integration of biological, chemical and pharmacological investigation in the search for efficient anthelmintics.**—*Aust. vet. j.* 24. 220–225. 1309

R. discussed the biological basis of critical experimentation in chemotherapy and in the selection of possible anthelmintic agents. The processes to be used may be grouped into three phases:—(1) the biological investigation in which the relationships between the biological lesion and the host system are examined to determine the type of component which should be selected for further study; (2) the chemical and physical investigation, involving the synthesis of the derivatives and analogues of the type compounds and the determination of their physical and chemical properties; and (3) the pharmacological investigation, which involves the correlation of the pharmacological, chemical and physical properties of the type compound and its derivatives, and the

determination of molecular structures enhancing the required action on the biological lesion or suppressing action on the host system. A wide variety of nematodes utilize oxygen *via* cytochrome carriers *in vitro*, but it is not certain whether intestinal nematodes are aerobic or anaerobic. Many nematodes examined had low respiratory quotients. Glycolysis follows the normal route as far as lactate formation, but there is an unexplained leakage of carbohydrate during the process. Energy transport took place through typical phosphate-bond energy transfer, except that no phosphoguanidine compounds were found. Evidence of unique metabolic routes in fermentation and oxidation of carbohydrate fractions was found.

Some work on phenothiazine was carried out. It appears to affect the breakdown of glycogen in nematodes; in particular, it acts as an inhibitor of acid phosphatase. Phenothiazine labelled with radio-active sulphur was found to penetrate the nematode cuticle or enter the sex orifices, in contrast to radio-active phosphate which is taken up almost entirely *via* the alimentary canal.

—H. McL. GORDON.

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

LAMARRE, L., LAMARRE, H., & TILQUIN, A. (1948.) Tumeur de la mâchoire supérieure, chez un poulain nouveau-né. [A tumour of the maxilla of a newborn foal.]—*Rec. Méd. vét.* 124. 218–217. 1310

An account, illustrated by five photographs, of the macroscopic appearances of a tumour of the maxilla which was present at birth in a foal which died when three days old. No histological examination was made.—E. COTCHIN.

OLSON, C. (1948.) **Spontaneous lymphocytoma in a flock of chickens.**—*Amer. j. vet. Res.* 9. 198–200. 1311

Observations extending over a period of six months were made on a flock of Rhode Island Red pullets in which an apparent epizootic of lymphocytoma occurred. Features of the outbreak were the high initial mortality, declining after two months to a much lower, though fluctuating rate, and the relative absence of pathological conditions such as fowl paralysis which are associated with lymphocytoma. Inoculation of half the flock with transmissible lymphoid tumour tissue attenuated by alternate freezing and thawing failed to control the epidemic. Preparations of tumour material from affected birds failed to produce significant immunity against a transmissible lymphoid tumour, and five attempts at transplantation of such material were unsuccessful.—M. R. ORMEROD.

I. BURMESTER, B. R., & DENINGTON, E. M. (1947.) **Studies on the transmission of avian visceral lymphomatosis. I. Variation in transmissibility of naturally occurring cases.**—*Cancer. Res.* 7. 779–785. 1312

II. BURMESTER, B. R. (1947.) **Studies on the transmission of avian visceral lymphomatosis. II. Propagation of lymphomatosis with cellular and cell-free preparations.**—*Ibid.* 786–797. 1313
[Summaries and conclusions copied *verbatim*.]

I. The transmissibility of tumors from 10 cases of naturally occurring visceral lymphomatosis was tested by inoculation of cellular and cell-free preparations into groups of 13 to 21 day-old chicks.

Lymphomatous tumors of the viscera were reproduced by cell-containing preparations from 8 of the original tumors in 14 to 85 per cent of chicks in 93 to 183 days. Similar tumors were produced by cell-free preparations from 4 of the original tumors in 39 to 94 per cent of the chicks in 183 days. None of 41 noninoculated controls developed lymphomatosis during the same experimental period. Thus, tumors of some, but not all, cases of visceral lymphomatosis are transplantable, and part of these tumors may be transmitted to chicks by inoculation with filtrates. The active agent or agents appear to be of a size which will allow them to pass readily through bacteria-retaining filters.

Of the 10 donors that supplied visceral tumors, 7 also had gross or microscopic evidence of neurolymphomatosis. There appeared to be no direct relation between the presence of this lesion in the donor and the number of recipients that developed neural or visceral lymphomatosis.

II. The characteristics of 4 tumor strains, RPL 18, 19, 20, and 21, recently developed from cases of naturally occurring visceral lymphomatosis, were studied during their serial passage with cellular inoculum and in numerous passages with filtered preparations.

The injection of cellular suspensions into the peritoneal cavity of chicks 2 to 75 days of age produced regularly a high incidence of the disease with a lymphomatous involvement of the liver, spleen, kidney and other organs of the viscera. The tumorous birds almost invariably died within 4 weeks and passages were made in 5 to 15 days after inoculation.

Tumor preparations or plasma from tumor-bearing birds, rendered cell-free by centrifugation or filtration through bacteria-retaining filters, also produced a great number of cases with visceral tumors. None of the 34 non-inoculated controls developed tumors during the experimental period of 200 days.

The tumor cells in cases of Strains 18, 20, and 21, similar to naturally occurring visceral lymphomatosis, were located primarily extravascularly and filtrates of these strains had a comparatively long latent period (average survival period of 116 to 162 days).

In addition to the visceral tumors, cell-free preparations of Strains RPL 18 and 21 also produced osteopetrosis in 4 of 7 inoculations in proportions of 5 to 77 per cent.

The tumor cells in cases of Strain RPL 19 were located primarily within blood vessels, and filtrates of this strain had a comparatively short incubation period, features usually associated with transmissible erythroglobulosis.

In addition to the visceral tumors in birds of Strain RPL 19, the occurrence of hemangiomas was increased to 88 per cent in one series of passages and was reduced to zero in other series by the selection of appropriate donors.

Conclusive evidence is presented to show that tumors of visceral lymphomatosis may be reproduced by material which will readily pass through bacteria-retaining filters. This agent or agents may be propagated in serial passage by the inoculation of healthy chicks with cellular or cell-free preparations.

PORTER, K. R., & THOMPSON, H. P. (1948.) **A particulate body associated with epithelial cells cultured from mammary carcinomas of mice of a milk-factor strain.**—*J. exp. Med.* 88. 15—

24. [Authors' summary copied *verbatim*.] 1314

Epithelial cells from spontaneous and transplanted mammary adenocarcinomas developing in high-tumor strain CH mice have been grown *in vitro* and studied with the electron microscope. In preparations from three out of six tumors, an unusual particulate body has been found associated with the cells. The particles appear to have a spherical shape and a double structure consisting of a dense center and less dense outer zone. The diameter of the central dense portion is fairly uniform from particle to particle, averaging approximately 75 m μ ; whereas the outside, whole particle diameter is more variable and averages about 130 m μ . From the micrographs it would appear that these peculiar virus-like bodies are situated chiefly in the ectoplasmic portion of the cell. They may occur singly, in pairs, or in clumps of varying sizes. Cells containing great numbers of the particles show signs of degeneration, and cell fragments are frequently encountered with many particles on them.

So far, the particles have been found only in association with the epithelial cells of the cultures. They are apparently not derived from the culture media. All in all the findings are consonant with the view that the particles represent the milk agent. Further evidence for or against this assumption is being sought from a study of cells from normal tissue and tumors demonstrated to be agent-free.

SMITH, W. E., & ROUS, P. (1948.) **The neoplastic potentialities of mouse embryo tissues. IV. Lung adenomas in baby mice as result of prenatal exposure to urethane.**—*J. exp. Med.* 88. 529-554. [Authors' summary copied *verbatim*.] 1315

The observation that adenomas develop very rapidly in the pulmonary tissue of mouse embryos implanted together with methylcholanthrene, in adult animals, has led to tests of the neoplastic potentialities of this tissue *in utero*. C strain females in the latter half of pregnancy were injected with urethane and the lungs of their young were searched for adenomas. None could be perceived with certainty in embryos at term or in mice just born, but they were several times found 3 days after birth and they were frequent and much larger in 10-day-old animals. The controls showed none. After 60 to 70 days they were often visible in the gross. Corroboratory findings were obtained in A mice. No parallelism could be perceived in the incidence of the tumors in mothers and offspring.

The adenomas arose from tissue devoid of any sign of preliminary local disturbance. Mitoses were abundant in them and they grew rapidly for a while, but within 2 months cell division had

almost ceased. By this time however many of the neoplasms were as big as any adenomas in the urethanized mother animals and in some instances twice as big. While growing fast they underwent little differentiation, but this took place when proliferation slowed and in consequence the tumors came to have the morphology of the spontaneous and induced adenomas of adults.

The neoplastic cells were derived from alveolar elements, yet in proportion as differentiation of them occurred they came to resemble the

See also absts. 1412 (endocrinology of neoplastic diseases); 1413 (pathology of tumours).

epithelial cells lining the small bronchioles. Occasionally the resemblance to bronchial epithelium was complete, save that the cytoplasm of the tumor cells was slightly basophilic.

LOMBARD, C. (1947.) *Le problème du cancer. [The cancer problem.]—Rev. Med. vét. Lyon et Toulouse.* 98. 367–382. 1316

This is a general discussion on cancer, its nature, theories as to causation, and the circumstances in which the conditions occur.—M. R. O.

NUTRITIONAL AND METABOLIC DISORDERS

SEEKLES, L. (1948.) *The biochemical approach to animal disease. The Fison Lectures, 1948, of the Animal Health Trust. I. The biochemical basis of veterinary science general lecture. II. Gastro-intestinal auto-intoxication in cattle and horses. III. Real and conditioned deficiencies of minor elements in cattle.—Vet. J.* 104. 203–213; 238–251; & 279–293. 1317

I. Biochemical disorders without morphological changes often occur in animals kept for production, unsuitable nutrition being commonly responsible for their onset. Such disorders may be termed auto-intoxications although they may arise in cases in which the composition of the food is quite normal. Here, the development of symptoms is determined by the way the animal reacts to the food administered. In addition, the abnormal loss of chemical substances from the body such as occurs in milk secretion may also be responsible for biochemical disorders. Thus, the quantity of calcium daily leaving the body of a dairy cow in full production amounts to about twelve times the quantity of calcium present in the blood of the same animal, so that there must be a considerable daily transference of calcium from the intestine *via* the blood stream to the mammary glands and should there be interference with this mechanism, the blood calcium values will be found to be abnormal.

It is certain that the normal state is characterized by a high degree of constancy in the chemical composition of the blood and other body tissues and that there is a biochemical "balance" within and without the cell. Should this become abnormal in any part, dysfunction will result which may or may not be accompanied by morphological changes. The electrolytes play the most important part in maintaining this "balance" but other substances such as blood sugar, urea, vitamins, etc., are also concerned. In this regulating system, the endocrine organs, autonomic nervous system, reticulo-endothelial system and blood corpuscles are all involved.

II. Proper nutrition and the proper functioning of the alimentary canal are all important for the maintenance of health, any abnormality affecting these being likely to give rise to an auto-intoxication.

Auto-intoxication may arise from many causes. It may be due to an increased intoxication, *e.g.*, a sudden change of diet producing abnormal bacterial activity or abnormal chemical reactions within the alimentary canal. Or it may be due to a decreased detoxication by the liver of such poisonous substances as indole and skatole which are normally easily dealt with. Or it may be due to ill-health on the part of the wall of the alimentary canal from bacterial infection or the presence of parasites. A significant finding has been that the blood serum levels of calcium, magnesium and inorganic phosphorus show similar trends in auto-intoxications of different origins. In cattle, a hypocalcaemia, slight hypomagnesaemia and increased inorganic phosphorus is the typical picture. In horses, however, hypomagnesaemia is more prominent.

Auto-intoxications are usually accompanied by liver disturbance which may take the form of a fatty infiltration or degeneration. This is seen for example in alimentary ketosis in cattle which frequently occurs when silage containing an excess of butyric acid is fed. The acetonæmia is due to the failure of the liver to oxidize the excess ketone bodies arising from the butyric acid. The normal functioning of the liver is mainly dependent upon a proper ratio of glycogen to fat and in cases of impairment the glycogen content falls and the fat content increases. Since glycogen is synthesized by the liver mainly from lactate, in order to maintain a proper ratio of glycogen to fat, lactate therapy has been used in these cases. This consists in the administration of 100 g. ammonium lactate in 500 ml. water twice daily. This has proved highly successful and the evidence so far obtained suggests that lactate therapy is of benefit in liver dysfunction in both cattle and horses.

Other therapies which have proved helpful in auto-intoxications are such as the feeding of hay or even straw to cows grazing on young grass in the spring when grass tetany is likely to occur. In horses, the subcutaneous injection of 30 g. crystallized magnesium chloride in 10% sterile solution has given some excellent results in cases of hypomagnesaemia. In auto-intoxications where bowel stasis is in evidence, the intravenous injection of 4 g. methylene blue in 2% sterile solution is of value since it increases the oxidation rate of histamine and histamine-like substances which are probably responsible for the dehydration seen in such cases. With the same object, the administration of minor elements such as copper or cobalt may be of value since they also catalyse oxidations.

III. What may be termed conditioned deficiencies arise from the absence of minor elements in the diet, the more important being copper, cobalt and manganese. For example, an absence of copper may lead to pica or licking sickness of cattle. In other cases there may be delayed growth, diarrhoea which is usually a prominent symptom, greying of the hair and shedding of the coat. Diarrhoea aggravates the condition as it may give rise to a decreased absorption of these minor elements. There appears to be an optimal concentration of these substances in the body above or below which disturbance of health may occur. They may be taken up in the molecules of enzymes, vitamins or hormones, the products so formed acting as catalysers of intermediate metabolic processes or they may act as activators or enzymes.

In balance experiments with copper sulphate it was found that in cattle about 80% of the copper administered was retained in the body and from a study of the distribution of radio-active copper salts, that it was mainly stored in the liver. The copper content of horse liver was found to be higher and more constant than that of cattle. The manganese content of pastures is known to vary considerably, mainly depending on the pH of the soil, the lower the pH, the more manganese absorbed by the plant. Manganese deficiency has been associated with sterility in rodents and may be the cause of some forms of sterility in cattle, but it is not associated with grass tetany. The normal liver content of cobalt in cattle appears to lie between 800 µg. and 400 µg. per kg. dry weight but in animals with cobalt deficiency values of about 120 µg. are usually found.—J. A. NICHOLSON.

DAVIS, R. N., & KEMMERER, A. R. (1948.) **Lactating factors for dairy cows in dried grapefruit peel.**—*J. Dairy Sci.* 31. 978-975. [Authors' summary copied *verbatim*.] 1318
Four lb. daily of dried grapefruit peel added

to an alfalfa hay ration increased milk production. An equal amount of a grain mixture did not maintain this increase. Supplementing a ration of alfalfa hay and concentrate mixture with oat pasture definitely increased milk production. It is concluded that dried grapefruit peel contains factors which stimulate milk production in dairy cows.

MCCLYMONT, G. L. (1948.) **Comparative value of urea and protein for supplementing low protein rations for growing cattle.**—*Aust. vet. J.* 24. 197-204. 1319

Four experiments are described on the comparative value of urea and protein (from protein concentrates or lucerne chaff) as supplements to low-protein rations comprising varying proportions of wheaten chaff and grain.

It is concluded tentatively that, for growing heifer calves, the efficiency of urea nitrogen for stimulating growth, or for increasing the efficiency of food utilization is not greatly, if at all, affected by the presence or proportion of grain as a supplement to a low-protein roughage such as wheaten chaff.

The efficiency of urea in comparison with protein for stimulating growth in excess of that obtained from the basal rations averaged 59.9%. Its efficiency in comparison with protein in reducing feed required per lb. gain below that required on the basal ration averages 67.5%.

The economics of urea feeding under Australian conditions are discussed.—R. L. R.

KEARNEY, E. B., POND, W. L., PLASS, B. A., MADDY, K. H., ELVEHJEM, C. A., & CLARK, P. F. (1948.) **The influence of varied protein intake and of tryptophane deficiency in Theiler's encephalomyelitis of mice.**—*J. Bact.* 55. 89-111. [Authors' summary copied *verbatim*.] 1320

Low protein (9 per cent casein) and high protein (36 per cent casein) diets have, in our hands, exerted no influence on infection of mice with Theiler's GDVII virus.

A marked effect on this disease has, however, been produced with diets deficient in tryptophane. The deficiency has been induced by feeding pure amino acid diets (containing only the essential amino acids) minus tryptophane and by feeding acid-hydrolyzed casein; in one series double amounts of vitamins were also given in an attempt to rule out possible complications in the deficiency. Regardless of the diet used to produce the deficiency, or of the presence of extra vitamins and the nonessential amino acids, the results have been an accelerated death rate compared to control deficient, a delayed death rate compared to those mice receiving the same diets plus 0.3 per cent tryptophane or the 18 per cent casein optimum

diet, and a lack of the characteristic signs of infection in the majority of deficient mice. The signs shown by these animals are, however, characteristic of the deficiency but appear earlier than in uninoculated controls, the effect seeming to be a precipitation of the deficiency by virus infection. That the virus had multiplied in the deficient mice in which no signs of infection could be observed was demonstrated by titration of their brains and cords in young normal mice. Histological studies confirmed this, since evidence of encephalitis was found in such animals. Mice receiving tryptophane, added to the purified amino acid or acid-hydrolyzed casein diets, or those on the 18 per cent casein diet, showed typical encephalitis and progressive paralysis. On the amino acid diet paralysees were frequently fewer than on the 18 per cent casein diet, but infection was indicated by encephalitis when paralysis was absent.

Tryptophane deficiency alone has produced definite signs. Among these is a convulsion of the tonic type, during which the hind legs of the mouse are completely extended, the forelegs flexed, and the whole mouse is extremely rigid and cyanotic. At times the hind legs are extended and the forelegs move convulsively. These convulsions occur in late stages of the deficiency, since death usually follows within several days. Death may occur in one of these seizures, but often the mice undergo such convulsions 3 to 5 times on as many days before dying. The possibility that a latent virus is responsible for these signs has been tested by passage of the brains and spinal cords of these mice intracerebrally into young normal mice and intracerebrally or subcutaneously into guinea pigs. No evidence of an infectious agent was found.

REID, J. T., PFAU, K. O., SALSBUURY, R. L., BENDER, C. B., & WARD, G. M. (1947.) **Mineral metabolism studies in dairy cattle. 1. The effect of manganese and other trace elements on the metabolism of calcium and phosphorus during early lactation.**—*J. Nutrit.* 34. 661-676. 1321

It has frequently been demonstrated that a negative calcium balance and sometimes a negative phosphorus balance occurs during the early periods of lactation. These experiments were carried out to see whether any of the trace elements influences the assimilation of calcium in lactating dairy cows. Twelve cows in the first five months of lactation were given different mineral supplements; one group received salt, another calcium carbonate, another calcium carbonate and manganese sulphate, and the fourth a composite mineral mixture containing calcium, magnesium, manganese, iron, iodine, copper, zinc and cobalt. The result indicated that the addition of manganese to

a calcium supplement caused every cow to go into negative calcium balance while calcium alone reduced the incidence of negative calcium balance. Calcium equilibrium was maintained most frequently in the fourth group receiving the composite mineral mixture.—A. T. PHILLIPSON.

ASKEW, H. O. (1946.) **The effectiveness of small applications of cobalt sulphate for the control of cobalt deficiency in the Sherry Valley, Nelson.**—*N.Z. J. Sci. Tech.* 28A. 37-43. 1322

Five sheep were run for 22 months on each of four 2-acre experimental plots treated as follows:—(1) control, no cobalt; (2) and (3), 4 oz. and 8 oz. cobalt sulphate per acre respectively, three weeks previously; (4) 16 oz. cobalt sulphate per acre three years previously.

The cobalt sulphate was top-dressed with superphosphate as the vehicle, all plots receiving 1 cwt. superphosphate each year.

Live weight gains in the sheep in the four plots averaged 14 lb., 49.2 lb., 58.2 lb. and 73.6 lb. respectively over the 22 months period. Marked weight losses occurred in the control plot sheep during the second summer, two sheep dying. Weight gains were correlated with the cobalt content of the pastures.

[No data are given to show the comparable effect of 5 oz. per acre annual top-dressings of cobalt sulphate which is now generally recommended for cobalt-deficient areas in New Zealand.]

—J. B. SWAN.

ENDER, F. (1946.) **Koboltmangelens betydning som sykdomsårsak hos storfe og sau belyst ved terapeutiske forsøk. [Importance of cobalt as a cause of pining in cattle and sheep: some therapeutic trials.]**—*Norsk VetTidsskr.* 58. 118-143. 1323

Cobalt deficiency caused such diseases as pica, dry-sickness, drought disease, anorexia, extreme emaciation and cachexia in cattle and sheep. Cobalt deficiency had greater aetiological importance than copper deficiency in pining conditions resembling hunger acidosis. Treatment with cobalt led to recovery in 90% of the cases. Cows and oxen were given two tablets containing 25 mg. cobalt acetate each per day, young animals and calves one tablet per day, and sheep one half tablet every second day. Short reports from various parts of Norway are given.—J. T. G.

THOMPSON, J. F., & ELLIS, G. H. (1947.) **Is cobalt a dietary essential for the rabbit?**—*J. Nutrit.* 34. 121-127. 1324

Rabbits fed whole milk and maize grain require less than 0.1 μ g. of cobalt per animal per day. This finding is discussed in the light of the hypothesis that the need for cobalt is peculiar to the ruminant species and may be concerned

primarily with bacteriological growth in the rumen. Cobalt has been found essential for the cure of Coast disease (pining in sheep) and is only effective when given by mouth and not when administered by injection.—G. D. SHEARER.

SMITH, S. E., & ELLIS, G. H. (1947.) **Studies of the manganese requirement of rabbits.**—*J. Nutrit.* 34. 33–41. 1325

Manganese requirements of rabbits were studied by feeding a diet low in manganese supplemented with various levels of manganese. As far as bone development is concerned it appears that 0.3 mg. of manganese per rabbit per day is enough to meet normal requirements. The minimum manganese intake necessary for maximum growth appears to be higher than the amount required for normal bone development.—G. D. SHEARER.

KRAKOWER, C. A., & HEINO, H. E. (1947.) **Relationship of growth and nutrition to cardiorenal changes induced in birds by a high salt intake.**—*Arch. Path.* 44. 143–162. 1326

Data are presented which indicate that the cardiorenal changes observed in chicks on a high salt intake occur only to their full extent where there is rapid growth. The changes are observed only where the daily intake of salt exceeds 0.3 g. per 100 g. bodyweight, but neither the concentration of the salt in the diet nor the daily intake of increasing amounts seem to be essential factors in the cardiorenal changes, provided that the concentration of salt is not high enough to interfere with the amount of food consumed.

The degree of cardiac hypertrophy could not be correlated with the daily salt intake, and the condition was not considered to result from the increase in mean blood pressure, this latter factor being very variable.

Marked glomerular hypertrophy occurred only where there was rapid growth. Where loss of weight occurred or where growth was restricted or in well-fed adults glomerular hypertrophy, if it occurred, was only very slight. There appeared to be some relationship between increase in renal weight and an increase in daily salt intake.—D. L.

ANDREWS, F. N., SHREWSBURY, C. L., HARPER, C., VESTAL, C. M., & DOYLE, L. P. (1948.) **Iodine deficiency in newborn sheep and swine.**—*J. Anim. Sci.* 7. 298–310. 1327

Examination of thyroid glands of new-born lambs and pigs in Indiana revealed frequent evidence of hyperplasia of the thyroid epithelium, low iodine content and low content of stored colloid, when the dams had been fed upon rations in common use in the area unsupplemented by iodized salt. Groups whose dams had been given iodized salt were significantly free from abnormal thyroid glands.—R. MARSHALL.

WIESE, A. C., JOHNSON, B. C., MITCHELL, H. H., & NEVENS, W. B. (1947.) **Riboflavin deficiency in the dairy calf.**—*J. Nutrit.* 33. 263–270. 1328

Three calves were fed on a synthetic diet, devoid of riboflavin, from the 48th hour after birth for 4–13 weeks. All the animals had a similar train of symptoms characterized by failure to gain weight, diarrhoea, loss of hair, hyperaemia of the buccal mucosa and excessive salivation; lesions at the corner of the mouth, on the lips and around the navel; loss of appetite and lachrymation. No opacity of the cornea or lens, however, was observed. Administration of riboflavin cured the condition.—A. T. PHILLIPSON.

SCHERER, J. (1946.) **Ueber die Bedeutung des Vitamins E in der Tiermedizin Der Vitamin E-Gehalt im Rinderplasma. [Vitamin E in veterinary medicine.]**—*Inaug. Diss., Zürich.* pp. 100. 1329

S. reviews the discovery and occurrence of vitamin E. α -Tocopherol is the most widely distributed in nature of the substances with vitamin E properties.

The physical and chemical properties are discussed, including the relationship with the sex hormones and with the vitamins A and B.

The requirements of vitamin E vary with species; the total dose and period of dosage are more important than the amount of individual doses; for man 30 mg. daily for 6–8 weeks are said to be optimal; in pregnancy more is required; as the new-born animal received little from the mother *via* the placenta it must therefore get its requirements from the milk; the onset of symptoms may follow a long period of deficiency and previous feeding with a high level of the vitamin may delay symptoms. Storage in the body is indicated, in the anterior pituitary, placenta, muscle, pancreas, spleen and liver; excess dosage is voided in the urine, faeces and milk. A very high dosage (50 g. per kg. bodyweight) has been tolerated in some species, but most reports indicate that in man and other species derangement of the reproductive system may result from over dosage.

Experimental E avitaminosis in female rats gave rise to no symptoms for some time, after which it led in the mildest cases to failure to rear the young, in greater deprivation to stillbirths and when the deprivation was complete, though oestrus and fertilization were normal, after 8–18 days the partially resorbed foetuses were voided and eaten by the mother; oestrus returned after a few days. No obvious histological cause of this effect could be demonstrated, though after prolonged vitamin E deprivation changes in ovaries and uterus were observed.

In male rats loss of function of the sperma-

tozoa was followed by failure to copulate and finally, after a year's deprivation of the vitamin, the animals behaved as though castrated; while the symptoms of female avitaminosis were reversed as a result of renewed intake, the male symptoms were only curable in the early stages.

Most authors agree that the addition of wheat germ oil or tocopherol to the diet of rats on a vitamin E-free diet causes increased growth. The effect of the vitamin in promoting malignant proliferation of cells reported by some authors has been denied by others.

In the young of female rats deprived of vitamin E neuro-muscular changes were apparent after about 21 days, resulting in increasing paralysis of the hind limbs; such young rats if reared by normal mothers remained healthy, while the young of normal rats if reared by deficient mothers became ill; thus the milk must contain the factor responsible. Once the symptoms were established improvement but not cure was possible; a concurrent creatinuria was observed.

A reported favourable effect of vitamin E on lactation was not always confirmed. There was some increase in haemoglobin and red corpuscle count following vitamin E dosage. Deficiency caused eye troubles including a conjunctivitis in young animals and exophthalmia in adults.

The mechanism of vitamin E activity has been ascribed to:—(a) a stimulating action upon progesterone, (b) a strengthening of the activity of the follicular hormone, (c) a direct effect upon the anterior pituitary which would account for the effects (a) and (b), an effect upon carbohydrate metabolism from which all other symptoms are derived.

Vitamin E has been used in human medicine either alone or together with corpus luteum hormone in the prevention of habitual or imminent abortion; for the promotion of more rapid growth and general well-being in premature or weakly new-born infants; in treatment of developmental and reproductive disorders, in such cases the results have been somewhat inconsistent; in some neuromuscular disorders with success if the disease has not proceeded too far; in treatment of male sterility.

In veterinary medicine, numerous authors have reported considerable reduction in abortions in cows infected with or in contact with *Brucella abortus* when vitamin E was given. Cases of abortion due to other causes, when no abnormality of the genitalia was apparent, were also favourably treated in this and other species. In cases of sterility of cows and pigs where no observable defect of the genitalia could be detected, dosage with vitamin E was found to give very favourable results and some nervous complaints of animals

were favourably treated. Vitamin E deficiency in poultry led to death of the embryo or of the newly hatched chick and to sterility in the cock; vitamin E dosage had favourable effects upon laying and breeding qualities. Reproduction in dogs, silver foxes and other fur-bearing animals was found to be dependent upon nutritional status with respect to vitamin E. The tocopherol content of the plasma of animals has been found by the fluorometric technique to be:—horses 0.2 mg. %; cattle 0.2–1.5 mg. %; dogs 0.3 mg. %.

S. determined the tocopherol content of plasma by:—(1) extraction with petroleum ether after treatment with alcoholic KOH; (2) oxidation with nitric acid to tocopherol red; (3) condensation of the product with *o*-phenylenediamine; (4) purification by chromatography on an activated aluminium oxide column; (5) fluorometric estimation.

The tocopherol content of the blood of cows maintained under standard conditions did not vary significantly during the day or from day to day; there was a considerable rise in the tocopherol of the blood when cows were changed from hay feeding to pasture and a fall when they returned to the hay; cows on a diet containing concentrates had a much higher tocopherol level in the blood than those fed upon hay only, but even higher values were obtained when the cows had access to green food. Cows pastured at high altitudes had high tocopherol levels in the blood; in this group of animals carotene was also estimated and it was found to follow the changes found in vitamin E.

Comparison of the vitamin E of the blood in healthy animals and those infected with *Br. abortus* indicated that throughout the year the latter gave lower values; the tocopherol increased when green food was given in both groups, a lag at the beginning of this increase (possibly due to the filling up of storage depots) was longer in the infected animals and the fall in tocopherol at the end of the pasturing period was more abrupt. Vitamin E deficiency may be a predisposing cause of *Brucella* infection.

There was some indication that high tocopherol values were associated with good milk yield and *vice versa*.

The cows on a well-managed farm where the average vitamin E intake was high gave little trouble with parturition and *post-partum* troubles, calf rearing or sterility.—R. MARSHALL.

HALSE, K. (1948.) Investigations on serum phosphatase in dairy cows during hypomagnesemia.—*Skand. VetTidskr.* 38. 567–586.
[In English.] 1330

Lower values in serum phosphatase activity were found associated with tetany and paresis in

cows. In affected cows positive correlation was found between serum magnesium and phosphatase in blood samples secured during the whole season. In two cows fed an additional magnesium supplement the magnesium phosphatase correlation was negative showing that feeding factors other than magnesium had a predominant influence on the phosphatase. Observation on fasting and underfed cows showed that the amount of magnesium supplied had little direct influence upon their serum phosphatase. Their positive correlation mentioned might then be caused by factors other than magnesium and phosphatase. Factors disturbing the normal energy supply such as the starch equivalent might be active.—G. D. S.

EWER, T. K., & BARTRUM, P. (1948.) **Rickets in sheep.**—*Aust. vet. J.* 24. 73-85. 1331

The authors found that young, growing sheep during their first winter in the Canterbury Province of New Zealand's South Island, where fodder crops or supplements have to be provided to obtain good weight gains, were unable to synthesize enough vitamin D or to obtain it from the feeds generally available. Consequently there was interference with bone metabolism, giving rise to rickets, while evidence has accumulated which indicated that, even when the usual bone and blood changes characteristic of this disease were not present, the rate of growth was frequently slowed.

Rickets occurred with greater frequency and severity in hoggets grazing cereals. Only occasional cases of rickets were seen in hoggets grazing turnips, "chou moellier" and pasture, while the incidence among those grazing Italian rye-grass seemed to occupy an intermediate position. The authors consider that some specific principle found in highest concentrations in green cereal crops interferes with phosphorus metabolism.

A massive dose (10⁶I.U.) of vitamin D, given to young sheep at the beginning of winter was entirely effective in both prevention and treatment of rickets in growing sheep and also had a growth-promoting effect.—M. C. FRANKLIN.

CRAIGE, A. H., Jr., & STOLL, I. V. (1947.) **Milk fever (parturient paresis) as a manifestation of alkalosis.**—*Amer. J. vet. Res.* 8. 168-172. 1332

In view of the evidence which suggests that the determining cause of milk fever is an alkalosis, 12 cases of the disease, six of which also had acetonæmia, were treated with chlor-ethamine (ethylenediamine dihydrochloride), an oral acidifier which releases hydrochloric acid in the body. Analyses of blood samples showed that following the injection of calcium gluconate the serum calcium was not significantly raised during the next 24 hours even in those cases in which clinical

improvement was noticeable. The administration of chlor-ethamine in addition to the injection of calcium gluconate, however, brought about a significant rise of serum calcium in all cases so treated. In cases complicated by acetonæmia, the serum calcium was found not to fall so low as in uncomplicated milk fever, the average values being 6.01 mg. per 100 ml. serum in the former and 4.87 mg. per 100 ml. in the latter. It was also observed that the serum calcium level recovered more quickly when acetonæmia was present.

It is a common experience that calcium therapy alone is often followed by relapses but when chlor-ethamine was also given no relapses were encountered. Although chlor-ethamine alone brought about the recovery of one animal, since it has to be given by the mouth which would be impossible if the animal were comatose, the recommended procedure is to give the standard dose of calcium gluconate intravenously and then, when the cow rises, to give the first dose of chlor-ethamine which is repeated at eight-hourly intervals as long as may be required. A single dose for a 1,000 lb. cow is 40 g. chlor-ethamine administered in a quart of tap water, with larger cows 60 g. may be given.—J. A. NICHOLSON.

CRAIGE, A. H., Jr. (1947.) **A clue to the cause of milk fever in the metabolism of the springing cow.**—*Amer. J. vet. Res.* 8. 247-256. 1333

At the onset of lactation there is a sudden demand for calcium by the mammary glands so that anything which hinders the mobilization of calcium to replace this loss predisposes to an attack of milk fever. It is not without significance that the disease became common when attempts were made to increase milk secretion by high feeding, such feeds being predominantly alkalinizing in effect. Moreover, milk and particularly colostrum is acid so that the high producing cow is losing hydrogen ions as well as calcium in considerable amounts. The loss of hydrogen ions is reflected in an increase of plasma bicarbonate and the alkaline food aggravates the position. Analyses of blood from cows calving normally shows that there is a tendency for the serum calcium to fall during the parturient period, *i.e.*, between five days *ante*- and five days *post-partum* and that the lowest serum calcium values coincide with the time at which colostrum is being excreted. This is due to the fact that calcium is not readily made available under alkaline conditions such as occur at this time and if they become sufficiently severe a definite hypocalcæmia will follow.

Evidence that the parturient cow develops an alkalosis was provided by experiments which showed that the administration of sodium bicarbonate *per os* to non-parturient cows was followed by a rise in the carbon dioxide capacity of the

blood and a hypocalcaemia and if the alkalization was pressed, clinical symptoms of milk fever could be produced. The acetonaemia which so often accompanies milk fever is a physiological response to the need for hydrogen ions which has become over-exaggerated. It is concluded that there is sufficient evidence to suggest that an alkalosis is the underlying cause of milk fever.—J. A. N.

HEM, M. (1947.) Orienterende undersøkelser over jodkasein til melkekyr. [Preliminary trials with iodinated casein to dairy cows.]—Reprinted from *Norsk Landbruk*. 13. 497-499. [English summary.] 1334

Four cows (breed not stated), aged two and a half, three, five and a half and seven years, all poor milkers, were each given 15 g. iodinated casein per day mixed with their fodder over one or two periods of 3-5 weeks, 39, 117, 65 and 203 days after calving respectively. The first cow had

See also abst. 1414 (science and nutrition).

a 30 % increase in milk yield and 33 % increase in butter fat during the first trial period of three weeks, and during the second trial period these increases were 13 % and 17 %. The second cow had an increase of 14 % milk yield and of 17 % butter fat; the third cow had 22 % and 5 % increases. The fourth cow had an increase in milk yield of only 1 % and a decrease in butter fat of 7 %. Bodyweight remained constant in the first three cows, but decreased by 25 kg. in the fourth cow.

H. concluded that an iodinated casein supplement was of practical value only when fed to cows which were putting on weight and were poor milkers. Given over a fairly long period, iodinated casein tended to cause loss of weight in cows. The increase in milk yield was costly. Thus his findings agreed with those of workers in Great Britain, the U.S.A., Sweden and Denmark.

—F. E. W.

DISEASES, GENERAL

SCHOFIELD, F. W. (1948.) Sulfamethazine (Sulmet) in the treatment of joint ill in the foal.—*Canad. J. comp. Med.* 12. 305-306. 1335

Nine foals were treated for joint-ill by the subcutaneous injection of decreasing amounts of sodium sulphamethazine (sulmet) over a four-day period. Seven animals completely recovered and two died.—THOMAS MOORE.

GILMORE, L. O., & SELLERS, A. F. (1948.) Sacral deformity in the "wrytail" abnormality in cattle.—*J. Dairy Sci.* 31. 797-803. 1336

An anatomical investigation was made into the "wrytail" condition in a seven-year-old pure-bred Jersey cow. The abnormality was first noticed at two years old but may have been present earlier.

At slaughter the rump was removed and the soft tissues separated from the sacrum and tail. A radiograph was taken during life, another of the frozen rump and six views were made of the cleaned sacral segments.

The first four sacral segments were fused; there was no fusion between the fourth and fifth sacral segments. The fifth sacral segment and the tail lay at an angle of 12° to the right of the longitudinal axis of the rest of the vertebral column. 5° of this deviation occurred within the body of the fourth sacral segment and 7° at the point of fusion of the third and fourth segments.

—E. J. H. FORD.

RABKIN, S. (1946.) Comparative alveolar pathology in sheep and goats.—*J. dent. Res.* 25. 518-520. [Abst. in *Nutr. Abstr. Rev.* 17. 284.

(1947), copied *verbatim*. Signed: D. E. TRIBE.] 1337

The two chief types of alveolar degeneration found in man and most animals, namely, atrophy of the cellular structure in absence of pus, and suppurative necrosis of the walls and septa of the tooth sockets, are first described.

A comparison was made between these and the very different degenerative age changes in the jawbones of sheep, as revealed by a limited study of 36 freshly slaughtered animals. In age these ranged from 6 months to 12 to 14 years. In sheep the alveolar processes showed no appreciable reduction in spite of looseness of teeth and loss of supporting bone. Most characteristic in the entire process of change from normal to pathological was the replacement of resorbed bone by fat. The influence of the sheep's grazing habit on bone degeneration is indicated.

An attempt was made at a similar study on the goat, but this was impossible owing to scarcity of material and technical difficulties.

Numerous photographs illustrate the text.

GLÄSSER, K. (1948.) Ueber die vielörtliche, hyalin-schollige Herz- und Skelettmuskularentartung bzw. den enzootisch auftretenden Herz- und Kreuzschlag des Schweines. [Multiple areas of hyaline heart and muscular degeneration in enzootic apoplexy in swine.]—*Berl. Münch. tierärztl. Wschr.* Nr. 7/8. pp. 42-45. 1338

The condition usually attacks well-fed store-pigs, not affecting sows, young pigs or animals in poor condition. Attacks develop following exer-

cise, and, when heart muscle is involved, death occurs rapidly. When voluntary muscles only are involved paralysis supervenes. A comparison is drawn between this condition and myohaemoglobinaemia in horses, the pathological changes being said to be similar. The effects are aggravated in swine by habitual lack of exercise and more rapid development of muscle at the growing stage. Precautions taken to avoid such conditions have, however, proved ineffective in many cases, and the existence of a virus infection is postulated but not proved.—A. M. LOOSMORE.

KLEIN, H. (1948.) **Dental effects of community waters accidentally fluorinated for nineteen years. II. Differences in the extent of caries reduction among the different types of permanent teeth.**—*Publ. Hlth Rep., Wash.* 63. 563-578. 1339

It is now generally accepted that children born and reared in an area where they consume waters containing 1-2 p.p.m. of naturally occurring

fluoride have as a group a lower than usual prevalence of caries than children born and reared in a non-fluoride area. The depressant effect of fluoride on caries may be approximately equal for all different types of teeth. The resultant effect may be a variation in the percentage reduction of caries among the different teeth. It is probably true that the tooth most protected by exposure to fluoride will also be that tooth having the strongest natural resistance to caries.—G. S.

LINDQUIST, G. (1948.) **The influence of wool fat on the healing of wounds.**—*Acta path. microbiol. scand.* 25. 598-602. [In English, author's summary copied *verbatim*.] 1340

If wounds, experimentally produced on the skin of the white rat, are treated with wool-fat (or an ointment base containing wool-fat and water), the wool-fat is absorbed by the granulation tissue and forms extraneous bodies there, that seem to have a retarding influence on the wound healing.

POISONS AND POISONING

ELÝ, R. E., DUNN, K. M., & HUFFMAN, C. F. (1948.) **Cobalt toxicity in calves resulting from high oral administration.**—*J. Anim. Sci.* 7. 239-246. 1341

Equivalent amounts of cobalt fed as sulphate, chloride or carbonate were equally toxic to the dairy calf. Cobalt fed in excess of 40 mg. daily per 100 lb. bodyweight proved equally toxic to dairy calves. Increasing the methionine content of grain ration by the addition of casein did not reduce the toxicity of cobalt fed to dairy calves.

—G. D. SHEARER.

BLOOD, D. C., & WHITE, I. G. (1947.) **BAL (British anti-lewisite) as an antidote to poisoning with inorganic arsenic.** [Correspondence.] —*Aust. J. Sci.* 9. 151-152. 1342

B.A.L. (2,3 dimercaptopropanol), which has proved so effective as an antidote to poisoning with organic arsenicals was tested against poisoning with arsenic trioxide in rats. Optimal conditions for efficiency were provided in that B.A.L. was administered before, concurrently with and after the arsenic. There was considerable efficiency at a low dose rate of arsenic trioxide ($1.5 \times LD_{50}$) but much less at a higher rate ($2 \times LD_{50}$) indicating that the value of B.A.L. as an antidote to inorganic arsenic might be limited.—D. C. BLOOD.

DYBING, O., & DYBING, F. (1946.) **Den toksiske virkning av tetrakloretylen i oljeoppløsning. [Toxicity of tetrachlorethylene in oil.]**—*Norsk VetTidsskr.* 58. 59-63. 1343

The toxicity of tetrachlorethylene was found to be no greater when given in a fatty oil than when given undiluted to rats and mice. The

narcotic and fatal doses are no less for undiluted tetrachlorethylene than for tetrachlorethylene dissolved in oil.—J. T. GREAVES.

CARTER, G. R., & ARNOLD, R. M. (1948.) **An azoturia-like condition in mares eating Guango (*Pithecolobium saman*, Benth) pods in Jamaica.**—*Canad. J. comp. Med.* 12. 255-259. 1344

The seed pods of the guango tree fall to the ground during February and March, they have considerable food value and are readily eaten by cattle and horses. The authors describe five cases of a disease resembling myoglobinuria paralytica which occurred in mares during the months of February, March and April from 1943-47. The general symptoms are described as sudden onset while at exercise, stiffness and cramps of the hind-quarters, straddled gait, unwillingness to extend the limbs and knuckling of the fetlocks. The urine is dark coloured. Three of the mares were affected while in foal and in each instance the foal died. The other two mares became affected about six weeks after foaling, and their respective foals began to manifest symptoms almost immediately. The foal was removed from one of these mares and recovered; the mare died about two months later. Guango was withheld from the other mare and its diet was supplemented with cod-liver oil and dried yeast; both mare and foal recovered.

—THOMAS MOORE.

HAYSTON, J. T. (1946.) **Bracken fern poisoning in cattle.**—*Agric. Gaz. N. S. W.* 57. 620-621. 1345

Cattle may graze on bracken-infested pasture for several weeks before becoming suddenly ill.

From feeding experiments it was found that the toxic agent is present in small amounts and is cumulative. The only method of control is to remove stock from infested pastures.—D. C. B.

AUCHTERLONIE, L. (1948.) **Laburnum poisoning.** [Correspondence.]—*Vet. Rec.* 60, 633. 1346

A. reports a case of poisoning in a store pig fed on grass and chopped laburnum leaves. The symptoms were acute dysentery with blanched mucous membranes. The pig survived. A heifer ate leaves from an uprooted laburnum tree and the milk from all four quarters had a bitter taste, and contained large yellow clots. There was no diarrhoea and after six weeks the reduced milk yield had returned to normal.—R. M. L.

LE SOUEF, H. D. (1948.) **Poisoning of sheep by *Phalaris tuberosa*.**—*Aust. vet. j.* 24, 12–13. 1347

Ten to 21 days after being put to graze on a permanent pasture consisting largely of *Phalaris tuberosa* 20 of a flock of 100 mixed sheep had symptoms of hyperexcitability with twitching of ears and lips and inco-ordination. When running the gait was jumpy and stilted with frequent falling on to knees. When left alone the sheep gradually recovered and continued grazing. Recovery did not occur after removal to new pasture although no deaths occurred. P.M. examination in one sheep revealed no cause of the condition, the nervous system was, however, not examined.

See also absts. 1389 (subterranean clover) ; 1405 (copper poisoning).

PHARMACOLOGY AND GENERAL THERAPEUTICS

(For treatment of specific infections see under the appropriate disease)

HARTLEY, P. (1945/46.) **Notes on the international standards for antitoxins and antisera.**—*Bull. Hlth Org. L.O.N.* 12, 76–97. 1349

These descriptions of the preparation and assay of standard antitoxins were written in 1940, in case the existing international standard preparations should be destroyed. The preparation of standard tetanus antitoxin is described in detail; as the same method is used, only the differing values are given for diphtheria, *Staphylococcus*, gas gangrene (*Clostridium perfringens*, *Cl. oedematiens* and *Cl. histolyticum*) and *Pneumococcus* (Types I and II) antitoxins.

Slightly different methods are described for the preparation of standard antitoxins against *Shigella shigae* and *Cl. septicum*.—G. F. R.

BROOKER, L. G. S., & SWEET, L. A. (1947.) **Chemotherapeutic investigations of cyanine dyes.**—*Science.* 105, 496. 1350

The chemotherapeutic properties of the cyanine, styryl and related dyes were examined by

Cattle put on to the same pasture were not affected.—D. C. BLOOD.

ANON. (1948.) **Investigations into the etiology and control of enzootic (toxaemic) jaundice of sheep. Report of the Investigation Committee for the year 1947/48.**—*Aust. vet. j.* 24, 272–281. 1348

Two components, copper poisoning and heliotrope (*Heliotropium europaeum*) poisoning have been recognized in the disease complex toxaemic jaundice. They may occur separately or together. Liver damage is characteristic of the plant poisoning, and in the copper poisoning there is intravenous haemolysis, so jaundice is common in either case. Animals with liver damage due to heliotrope poisoning may die during a haemolytic crisis caused by copper intoxication. Deaths due to heliotrope poisoning do not occur until sheep have been eating the plant for a considerable time.

Toxaemic jaundice also occurs in sheep on pasture in which subterranean clover is dominant and appears to be uncomplicated copper poisoning. Other herbaceous plants, including the blue crowfoot *Erodium cymorum*, are suspected of producing copper poisoning. High copper and low molybdenum contents of these plants occur on certain soils in certain seasons, e.g., when heavy early autumn rains produce luxuriant plant growth. The only recommendation made, additional to those occurring in previous reports, is that heliotrope must be controlled and eradicated.

—D. C. BLOOD.

BROWNING *et al.* (1937). Many of the cyanine types possessed "antifilarial and anthelmintic activity", and some have antimalarial activity but to a lesser extent than that of already available drugs. One cyanine dye (1-amy-2,5-dimethyl-3-pyrrole) (1,6-dimethyl-2-quinoline)-dimethine-cyanine chloride, inhibited the growth of *Lactobacillus casei* at a concentration of (2×10^{-6} M), *L. arabinosus* at (2×10^{-6} M), *Streptococcus faecalis* at (4×10^{-6} M) and *Bact. coli* at (3×10^{-6} M). The inhibition of *Bact. coli* was partially reversed by vitamins B, B, nicotinic and pantothenic acids: The cyanines, however, had no effect on various enzyme systems. Tested *in vivo* against a representative range of organisms, including *Str. haemolyticus*, *Str. viridans*, *Staph. aureus*, *Str. pneumoniae* (type I), *T. equiperdum*, *T. pallidum*, St. Louis encephalitis, influenza, exanthematic typhus, none of the representative dyes possessed a therapeutically significant activity.—M. W.

SWAN, L. C. (1948.) **Benadryl in veterinary**

practice.—*Canad. J. comp. Med.* 12. 260-264. 1351

Benadryl (β -dimethyl aminoethyl benzo-hydryl ether) was used with beneficial effect in cats and dogs having allergic or allergic-like conditions. Between 30 and 40 cases were treated during July and August. No other effects of importance were observed and case histories of six were reported.—P. J. G. PLUMMER.

ZADINA, R., & KRIZ, V. (1948.) L'action du magnésium sur la contraction de l'intestin isolé. [Action of magnesium on contraction of the intestine.]—*C. R. Soc. Biol. Paris.* 142. 1037-1039. 1352

The concentration effect of histamine and acetylcholine on the isolated g. pig intestine was studied by constructing curves, using the log. dose as abscissae and the height of contraction as ordinates. The increased contractions produced by both these substances were lowered on the addition of magnesium chloride to the bath. There were characteristic differences in the shape of the curves so obtained, however, and also complete inhibition of the acetylcholine effect was produced with smaller concentrations of magnesium chloride than would inhibit the histamine effect. It is concluded that the action of histamine on the smooth muscle of the intestine is quite distinct from that of acetylcholine.—J. A. N.

LAWRENCE, C. A., KLINGEL, H., & GOETCHIUS, G. R. (1946.) Studies on highly soluble azo sulfonamides.—*J. Bact.* 52. 645-656. 1353

The advantages of soluble sulphonamides are pointed out and it was found that certain azo derivatives of the sulphonamides had therapeutic activity in mice. It was assumed that this activity was due to liberation of the parent sulphonamide in the body. The derivatives were generally less active than the parent substance.—JOHN FRANCIS.

ANON. (1948.) Penicillin in calfhood diseases.—*J. Amer. vet. med. Ass.* 113. 162. 1354

The author describes briefly a disease of calves that occurs in the first two months of life; enteritis is the main lesion and on clinical grounds he considers that it may be a paratyphoid disease. No bacteriological work was done. Penicillin was used on ten cases with good results.—M. R. O.

— (1948.) [Discussion on] Streptomycin. The present position. [Speakers: RUBIE, J., MARSHALL, G., FLEMING, A., RICHES, E. W., & OAKLEY, W. G.]—*Brit. med. J.* Nov. 6th. 831-882. 1355

Rubie dealt with streptomycin therapy of tuberculous meningitis in children and Marshall with streptomycin in pulmonary TB. Fleming said that the drug had a powerful effect on *Bact. coli*, but as the organisms may quickly become

resistant as big a dose as practicable should be given in order to kill off the organism. According to Riches the great value of streptomycin urologically was in post-operative and post-radiation infections. Oakley stressed that in giving streptomycin to diabetic patients with urinary infections, sugar must first be removed.—W. R. BETT.

WILDE, J. K. H., & BEAKBANE, H. R. (1948.) Critical observations on dimidium bromide ("1553"). [Correspondence.]—*Vet. Rec.* 60. 31-32. 1356

Investigating the possibility of variation in samples of dimidium bromide, three samples were compared as to their appearance, ability to dissolve, and stability in solution. In the case of one sample all concentrations down to 0.5% seemed incapable of perfect solution, whilst another sample was easily soluble at 3%, or below.

As regards stability in solution, it was found that small amounts of a dark brownish-orange solid were precipitated by all solutions. Considerable differences were found to occur between the samples observed over a period of five days in respect of the variation in light absorption, and also in the changes of the pH values of solutions.

—U. F. RICHARDSON.

MCCULLOCH, E. C., HAUGE, S., & MIGAKI, H. (1948.) The role of disinfectants in veterinary medicine. II. A critical evaluation of the quarternary ammonium compounds.—*J. Amer. vet. med. Ass.* 112. 283-290. 1357

The quarternary ammonium compounds, several of which have been marketed, particularly in the U.S.A., as antiseptics and disinfectants, are critically evaluated and results of experiments are given. Up to now it has been customary, in evaluating the quarternary ammonium compounds, to determine their phenol coefficients and on this basis these compounds have been claimed to have phenomenal disinfectant powers. For instance, phenol coefficient values, as high as 600, have been claimed.

In the presence of organic matter such high coefficient values are reduced to very low figures and experimental evidence may apparently reveal that a quarternary ammonium compound is no more active than phenol. The disinfectant action against bacterial spores was investigated with hyamine 1622 (*p*-di-isobutyl phenoxy ethoxy ethyl dimethyl benzyl ammonium chloride) and *Bacillus subtilis* spores. It was found that very little killing action was exerted on the spores even after 24 hours contact. The nature of water with which solutions of quarternary ammonium compounds are made up is important. It has been shown that calcium and magnesium salts interfere markedly with germicidal action, and with alkaline waters germicidal action is enhanced.

Quarternary ammonium compounds have, apparently, a useful skin disinfectant action and a finger treated with a quarternary ammonium solution is rendered sterile—i.e., when rubbed on a culture plate no bacterial growth results, unless the finger is first dipped in soap solution. This is explained by postulating that a quarternary ammonium solution forms a film over the skin and its resident bacteria and that the film is readily broken by the application of an anionic solution. In spite of this, however, a quarternary ammonium solution does sterilize skin so long as an anionic solution is not added.

With particular reference to veterinary application the evidence indicates that the value of quarternary ammonium compounds for general disinfection purposes is markedly restricted; they lose much of their effectiveness in the presence of organic matter and are best used for such purposes as the cleansing and disinfection of skin in the course of surgery. Their lack of sporicidal power also makes them unreliable. An important property of quarternary ammonium compounds is that they have a strong detergent action which is as important as any bactericidal action they may possess. [Recent research had developed a reliable test of bactericidal power of quarternary ammonium compounds and although the misleading phenol coefficient values are now known not to hold good, nevertheless a high bactericidal power is genuinely possessed by some quarternary

ammonium compounds, so if they are correctly used there is a useful field of employment for them in hygiene and especially in surgical practice.]

—J. E.

BAKER, W. L. (1946.) **DDT and earthworm populations.**—*J. econ. Ent.* 39. 404–405. 1358

Part of an American elm wood was experimentally sprayed with 0.25 % D.D.T. in xylene. Drought conditions prevailed during the summer, autumn and winter and by the following March there had been little earthworm activity. A month later the earthworms had removed nearly all the leaves from the unsprayed part. The sprayed area was still covered with leaves. Earthworm counts yielded one in the sprayed area to every three in the unsprayed area and there were very few immature worms in the former. By the end of May, however, the leaves in the sprayed area had decreased so that no difference between the two plots was noticeable.—BERYL A. THURSTON.

STANSLY, P. G., SCHLOSSER, M. E., ANANENKO, N. H., & COOK, M. H. (1948.) **Studies on polymyxin: the production of fermentation liquor.**—*J. Bact.* 55. 573–578. 1359

The authors describe a method for the routine production of polymyxin from *Bacillus polymyxa* from high potency fermentation liquor, on a large laboratory scale, giving details of nutritional and environmental factors, which were found to have an effect on the antibiotic production.—M. W.

See also absts. 1148 (penicillin); 1157 and 1158 (mastitis); 1167 and 1168 (tuberculosis); 1181 (pasteurellosis in swine); 1186 (fowl coryza); 1197 (antibiotics for brucellosis); 1213 (diamidines); 1214 (urinary infections); 1220 and 1221 (trypanosomiasis); 1227 and 1230 (trichomoniasis); 1231 (coccidiosis in cattle); 1260 (psittacosis); 1266 (chemotherapy of virus diseases); 1309 (anthelmintics).

PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY

ANON. (1948.) **The cerebellum reconsidered.**—*Lancet.* 255. 225–226. 1360

Recent experiments on cerebellar function, in which the form of stimulation has been controlled, suggest that cerebellar mechanism is integrated with that of the cerebral cortex by causing inhibition or facilitation of muscular contraction as the needs of the moment demand. Results of experiments in which areas of the cerebellum have been removed or destroyed point to a specific pattern of areas responsible to particular parts of the peripheral neuro-muscular system.—C. W. OTTAWAY.

V. WEEL, P. B. (1948.) **Histophysiology of the limb-bud of the fowl during its early development.**—*J. Anat.* 82. 49–57. 1361

Experiments were conducted on chick embryos ranging in age from three to five and a half days to determine whether histochemical differences could be detected between areas of different developmental potencies before histological differences were apparent.

The general conclusion is that physiological differentiation precedes morphological organization. It is also suggested that concentration of ascorbic acid in future muscle cells is a prior requisite to myoblast formation.—C. W. O.

CRAIGE, A. H., Jr. (1947.) **Physiologic reactions to intravenous calcium injections in the cow.**—*Amer. J. vet. Res.* 8. 260–266. 1362

From a study of the effects of intravenous injection of a standard dose of calcium salt equivalent to 500 ml. of a 15 % calcium gluconate solution it was found that in normal non-parturient cows the serum calcium rose immediately, as was to be expected, but returned to the pre-injection level within 24 hours. At the same time there was a reduction in serum inorganic phosphorus, which is presumably due to the excess of calcium being excreted in the urine taking phosphorus with it. In parturient cows, however, the injection of calcium was followed by a rise in serum inorganic phosphorus. This effect was also observed in non-parturient cows which had first been given

sodium carbonate *per os*, the alkali suppressing the solubility and excretion of phosphate. This suggests that the parturient cow develops a variable degree of alkalosis which may lead to a definite hypocalcaemia. Since calcium solutions have a pH of 5-6, their beneficial effect is more probably due to their acidifying action than to their calcium content.

A study of the toxicity of calcium injections showed that if the serum calcium is suddenly raised above about 20 mg. per 100 ml. symptoms of hypercalcaemia such as bradycardia, lachrymation, salivation and hyperpnoea may appear, so that the doses commonly used in practice are not without danger. In advanced toxicity from calcium injections there is dyspnoea, irregular pulse, tachycardia and inco-ordination which progresses to paralysis.—J. A. NICHOLSON.

LISON, L., & SMULDERS, J. (1948.) **Discriminating 'Athrocytes' in the reticulo-endothelial system.** [Correspondence.]—*Nature, Lond.* 162. 65-66. 1363

Certain cells termed "athrocytes" can store in granular form extraneous substances, mainly electro-negative colloids; this property being possessed to a varying degree. Some Kupffer cells of liver store "low dispersion" dyes with particle diameter greater than 60-80Å; others, "high dispersion" dyes with a smaller diameter. Components, of a binary mixture of one of each type of dye, are preferentially absorbed and therefore separated.

The presence of these discriminating athrocytes in the reticulo-endothelial system of mammals can be demonstrated by means of intraperitoneal injections of suitable dye mixtures. Fixed spindle-shaped histiocytes store the high dispersion component; wandering macrophages, with reniform nuclei store "low dispersion" dyes.

Transitional forms containing dye mixtures are noted, and taken as indicating the origin of the macrophages from the histiocytes. The critical dispersion value separating the two classes corresponds to a diffusion coefficient of 0.050×10^{-5} cm.² per sec.—ARTHUR W. MARRABLE.

RICHARDSON, K. C. (1947.) **Lactation: function and product. Some structural features of the mammary tissues.**—*Brit. med. Bull.* 5. 128-129. 1364

R. considers structural details associated with mammary development in primate and non-primate species.

A preliminary review of embryonic, foetal and pre-pubertal development centres attention on basic structure and the potentialities of duct and alveolar systems.

Hormonal influence stimulates intralobular duct and alveolar growth during oestral periods and the phenomenon of pseudo-pregnancy, but it is emphasized that at this stage of development it is difficult to distinguish between these two components of the gland as both are lined with a single layer of epithelium and are capable of secretory activity.

Development during pregnancy can be summarized as proliferative cellular growth during the first half with secretory activity becoming more prominent in the second half, resulting in dilatation of the alveoli and ducts and further increase in general size of the gland. It is stressed that lobule growth may not be uniform throughout the gland. Changes in shape of the alveolar cell during lactation are described and illustrated and the debated question as to whether the secretion is a product of the cell or whether the apical portion of the cell is broken off as part of the secretion (apocrine type) is discussed.

Following considerations of involution, quantitative estimation of mammary growth and the nature of the connective tissue stroma, R. concludes with references to the mechanism of milk expulsion. Smooth muscle fibres are associated with the teat and the larger duct systems; but the contractile power or even the presence of myo-epithelial cells in relation to the alveolar epithelium is considered a matter of doubt.

Examples are given of the necessity for employing suitable techniques in the preparation of histological material. The article is well illustrated.—C. W. OTTAWAY.

QUICK, A. J., SHANBERGE, J. N., & STEFANINI, M. (1948.) **The effect of heparin on platelets in vivo.**—*J. Lab. clin. Med.* 33. 1424-1430. [Authors' summary copied *verbatim*.] 1365

The effect of intravenously administered heparin on the circulating platelets was studied in man, rabbits, and dogs. Five brands of commercial heparin were used. No significant agglutination or thrombocytopenia was observed in man and rabbits even after relatively large doses. In dogs a dose of 1 mg. per kilogram of body weight invariably caused agglutination of platelets and a subsequent transitory thrombocytopenia. Probable causes for this are discussed.

BRIERLEY, J. B., & FIELD, E. J. (1948.) **The connexions of the spinal sub-arachnoid space with the lymphatic system.**—*J. Anat.* 82. 153-166. 1366

Critical review of the literature relating to the connexions between the spinal sub-arachnoid space and the lymphatic system has evidenced the importance of experimental technique, and detailed consideration of this problem introduces the technique employed by the authors.

Concentration of the indicator material (indian ink) used was found in the terminal spaces of the sub-arachnoid space about the spinal nerve roots in rabbits, and repeated experiments demonstrated the existence of a pathway through this membrane to the lymph channels in the epi-dural connective tissue. Segmentally arranged lymphatic vessels pass from here to the lymph nodes below the thoracic and lumbar vertebrae.—C. W. OTTAWAY.

BRESSOU, C. (1946.) De morphologie der longen. [Lung morphology.]—*Vlaam. Diergeneesk. Tijdschr.* 15. 119-126. [English, French & German summaries.] 1367

The lungs of different animals can often be distinguished by the appearance of the tissue because of the characteristic nature of the structures involved. The parenchyma may be divided into a series of pyramidal small masses, independent from each other and individualized by the distribution of the bronchi. Each division forms adjacent areas on the surface of the lung systematized by the distribution of the bronchi. The distribution of these areas is demonstrable by dissection, by X-rays and by the lesions caused by some parasites (Metastrongylidae).—J. T. GREAVES.

CHAIKOFF, I. L., GILLMAN, T., ENTENMAN, C., RINEHART, J. F., & REICHERT, F. L. (1948.) Cirrhosis and other hepatic lesions produced in dogs by thyroidectomy and by combined hypophysectomy and thyroidectomy.—*J. exp. Med.* 88. 1-14. [Authors' summary copied verbatim.] 1368

The reactions of the dog's liver to (a) thyroidectomy and (b) both hypophysectomy and thyroidectomy are described.

Fatty changes of varying severity were detected in 8 of the 9 hypophysectomized-thyroidectomized dogs, hepatic fibrosis in 7, and severe cirrhosis in 4 animals of this group.

Among the thyroidectomized animals histologically demonstrable fatty livers were present in all 8, mild fibrosis was observed in 4, while early and mild cirrhosis was diagnosed in only one dog.

Two pathogenetically distinct forms of cirrhosis were present in the livers of dogs with the two operations, namely (a) cirrhosis initiated and developing around the radicles of the hepatic veins, and (b) periportal cirrhosis.

Both forms of cirrhosis occurred in dogs that were subjected to the same experimental procedures, and both forms could be found in the same liver.

The pathogenesis of these two forms of cirrhosis is described.

The relation between fatty change in the liver and the genesis of fibrosis is discussed, and it is suggested that, while fatty change may facili-

tate the evocation of cirrhosis, this reaction on the part of the supporting and vascular elements of the liver is not solely dependent on the fatty change in the liver cells.

The relation between the endocrines and hepatic cirrhosis is discussed. Since cirrhosis was slight in the fatty livers of thyroidectomized dogs, whereas it was often advanced in hypophysectomized-thyroidectomized dogs, it is suggested that in the absence of the pituitary cirrhogenic mechanisms are facilitated in the dog.

DAY, T. D. (1947.) Membranous nature of interstitial connective tissue.—*Lancet.* 253. 945. 1369

In microscopical preparations, interstitial connective tissue appears to be composed of a network of fibres with occasional spindle-shaped or stellate cells, the meshes of the net being considerably larger than particles to which connective tissue is obviously impermeable.

D. finds that when a piece of rat fascia is spread on a glass slide, the corners fixed to prevent shrinkage, the surface bathed in a medium of pH 8.6 and a coverslip applied, the thinnest parts will show, on dark ground illumination, moderate opacity of the spaces between the highly-refractile collagen bundles. The opacity is composed of a faint amorphous haze, refractile granules and exceedingly fine, angularly-branching fibrils. The smallest collagen and elastic fibrils are embedded in the general opacity and all lie in one plane.

Similar delicate membranes and cobweb-like nets can be seen in preparations treated with neutral 50-60% alcohol. They are irreversible and protein in nature. Probably the phenomenon is due to precipitation of protein at the isoelectric point.—J. RICHARD HUDSON.

GOVAERTS, J., & DALLEMAGNE, M. J. (1948.) Influence of folliculin on bone metabolism, studied by means of radiophosphorus, ^{32}P . [Correspondence.]—*Nature, Lond.* 161. 977. 1370

Pigeons were given daily 0.15 mg. of labelled P subcutaneously and 80 mg. P in normal diet, and in addition some were given daily 0.25 mg. of oestradiol dipropionate intramuscularly. After 20 days it was found by means of autoradiographs and determinations of radio-activity that the femurs of pigeons receiving folliculin contained much more injected radio P than those of the other pigeons. 13.1% of bone P in the femur had been renewed in a pigeon receiving folliculin against 1.7% in one of the others. The mineral metabolism in the humerus was also accelerated by oestradiol. About half of the P present in new medullary bone came from P already stored in the skeleton, not from P fed or injected.—J. R. PICKFORD.

HARVEY, C. (1948.) **Relation between the volume and fructose content of human semen.** [Correspondence.]-*Nature, Lond.* 162. 812-813. 1371

There was found to be no relation between either fructose concentration or total fructose content of semen and fertility of the donor when 150 specimens of human semen from 123 individuals were examined.

It was, however, noted that the concentration of fructose was at a maximum when semen volume was between 4 and 5 ml. and decreased when the volume was greater or less. Ejaculates produced at a shorter interval than 48 hours after the previous emission had a lower fructose concentration than specimens produced after an interval of 2-8 days.

Assuming vesicular fluid to be the main source of seminal fructose, it is suggested that there is a marked variation in size of the seminal vesicle in man and that two days are required between ejaculates to restore vesicular fluid content.—E. J. H. FORD.

KINGMAN, H. E. (1948.) **The placentome of the cow.**—*Amer. J. vet. Res.* 9. 125-130. 1372

K. describes in detail the development and ultimate fate of the placentome. [This word is not to be confused with placentoma and has no pathological connotation. It is used to describe the new tissue formed during pregnancy resulting from the union of the foetal and maternal tissues and which begins to develop at the time of implantation of the fertilized ovum. It is essentially a development of the maternal cotyledon after contact has been established between it and the embryo.] He considers that in the past too little attention has been paid by those studying infertility to the physiology and endocrinology of the fertilized ovum, its implantation, retention, development and expulsion at the termination of gestation. The opinion is expressed that further studies of the placentome will aid in elucidation of problems of abortion, sterility and retention of the placenta.—M. R. ORMEROD.

RAO, C. K., & HART, G. H. (1948.) **Morphology of bovine spermatozoa.**—*Amer. J. vet. Res.* 9. 117-124. 1373

When stained with opal blue spermatozoa had a protoplasmic cap surmounting the acrosome, which the authors suggest may be the source of hyaluronidase. Many young spermatozoa have a protoplasmic drop posterior to the head, the position shifting posteriorly during development; this may be concerned with formation of the cylindrical sheath of the tail-piece. The authors conclude that great care is necessary in assessing semen values on morphological evidence, as

reliable criteria are difficult to establish. A small percentage of dead spermatozoa in semen is normal.—ARTHUR W. MARRABLE.

SCHULTZE, A. B., & DAVIS, H. P. (1948.) **Effect of thyroxine on oxygen consumption of bovine spermatozoa and semen.**—*J. Dairy Sci.* 31. 946-950. [Authors' summary copied verbatim.] 1374

Bovine spermatozoa and semen, diluted with a phosphate buffer, were treated with 7γ per cent DL-thyroxine.

Oxygen consumption generally was increased with the addition of thyroxine in semen samples with an original spermatozoan concentration of from 800,000 to 1,400,000 per mm.³

Semen samples with a spermatozoan concentration of less than 800,000 per mm.³ in the original semen were not influenced on the average by the presence of thyroxine in the concentration used.

The ability of semen to respond with increased respiration rate to added thyroxine appears to be related to some factor that is associated with original spermatozoan concentration.

The influence of bacterial and other contamination on results has been discussed. Its exact influence remains unevaluated.

REID, J. T., WARD, G. M., & SALSBUURY, R. L. (1948.) **The relationship of the change in pH effected by incubation to other semen characteristics.**—*J. Dairy Sci.* 31. 383-388. 1375

In an endeavour to devise a simple rapid test to evaluate bull semen the fall in pH following incubation at 37°C. for one hour was compared with the concentration, initial motility, viability and percentage of abnormal spermatozoa in 203 semen samples from 11 bulls.

The highly significant correlation coefficients between pH change and other characteristics were as follows:—concentration 0.46, initial motility 0.44, viability 0.21, percentage of morphologically abnormal spermatozoa -0.32.

It is pointed out that whereas in the experiment a potentiometer was used to determine pH values, a series of indicators could be devised for field use and a shorter incubation period of 30 min. might be more convenient.—E. J. H. FORD.

YEATES, N. T. M. (1947.) **Influence of variation in length of day upon the breeding season in sheep.** [Correspondence.]-*Nature, Lond.* 160. 429-430. 1376

A group of highly fertile Suffolk × Border Leicester-Cheviot ewes began to come into oestrus in September, some 10-14 weeks after the longest day. In the absence of pregnancy they had regular oestrous cycles to the end of March, some 10-14 weeks after the shortest day. A similar group of ewes was subjected to artificial

light so that their daily quota of light increased gradually from 13 hours in mid-October to 21 hours at the end of January. These ceased to have oestrous cycles two months earlier than the control group, but likewise 10–14 weeks after the shortest day of their exposure. At the end of January their daily quota of light was reduced from 21 hours to five and a half hours by the end of June, causing the onset of oestrous cycles at the end of May. Another group of ewes was introduced into the experiment at the end of March and these animals started to come into oestrus at the end of June, again 10–14 weeks after the longest day of their exposure. It is concluded that seasonal variation in length of day is the chief factor determining the time of onset of the breeding season in sheep. A change from increasing to decreasing length of day induced reproductive activity in 10–14 weeks while a change in the opposite direction induced anoestrus in 10–14 weeks.—A. T. COWIE.

ZLOTNIK, I. (1947.) **The cytoplasmic components of germ-cells during spermatogenesis in the domestic fowl.**—*Quart. J. micr. Sci.* 88. 353–365. 1377

A study of the changes which the cytoplasmic components, Golgi material and mitochondria of the male germ-cells of the domestic fowl undergo during the successive stages of spermatogenesis. Nuclear changes were also studied.

In the resting stage the Golgi material is in the form of a cap situated at the anterior pole of the nucleus. When the nucleus enters the prophase, the Golgi material spreads out along the nucleus and the mitochondria become more or less evenly distributed through the cytoplasm. With the beginning of the metaphase of the first spermatocyte division, the Golgi material breaks up and becomes dispersed through the cytoplasm. After the division of the cell the dispersed elements of the Golgi material reassemble to form

See also abst. 1415 (human histology, a guide for students)

the localized Golgi material of the second spermatocyte. The mitochondria remain scattered through all the division stages.

In the spermatid emerging after the second maturation division the Golgi material is composed of rods and granules lying on the surface of the archoplasm. After formation of the acrosome the Golgi material migrates to the residual cytoplasm and, as the Golgi remnant, is eliminated. The mitochondria are scattered around the Golgi material at first, then divide into groups, arrange themselves along the axial filament which originates from the two centrioles present, and finally, in the spermatozoon, form the mitochondrial sheath of the middle-piece.

One or more argentophile granules separating from the Golgi material are observed in the spermatid and one is included in the neck region of the spermatozoon; these granules, which are not observed in stained chrome-osmium preparations, are called "Golgi X".—J. JONAS.

URIST, M. R., BUDY, A. M., & M'CLEAN, F. C. (1948.) **Species differences in the reaction of the mammalian skeleton to estrogens.**—*Proc. Soc. exp. Biol., N.Y.* 68. 324–326. 1378

Treatment with natural oestrogens results in changes in bone density to varying degrees in different species. Approximately 0.5 mg. per week per animal of α -oestradiol benzoate or diethylstilboestrol produces endosteal bone formation in the metaphyses of the long bones of mice. The authors consider that the reticular cells become osteogenic in nature. In the rat, 0.14–0.5 mg. per week per animal of either of the above substances interferes with the degree of endochondral ossification by inhibiting the resorption of cartilage and increasing the length of bony trabeculae. In hamsters, g. pigs, rabbits, kittens and puppies there seems to be a general repression of cellular activity, without particular effects.

—ARTHUR W. MARRABLE.

PUBLIC HEALTH, VETERINARY SERVICES AND VETERINARY EDUCATION

GARLAND, M. E. (1947.) **Legal bacteriological and chemical standards of milk in the Australian States.**—*Aust. J. Dairy Technol.* 2. 135–138. 1379

This article is a plea for the adoption of uniform standard methods for the bacteriological examination of milk throughout Australia.

It is stated that while the adoption of uniform standards for milk may be rendered difficult by the varying climatic conditions of the States, at present there is no uniformity in method of carrying out the various tests.

In most States the reductase test is used as

an index of keeping quality, but G. considers the phosphatase test or the plate count to be more valuable.

Included are tables showing the required bacteriological and chemical standards for various grades of milk in all of the Australian States.

—J. H. WHITTEM.

WILD, A. S. (1948.) **Mill offal for rabbit poisoning.**—*J. Agric. W. Aust.* 25. 99–100. 1380

Methods of mixing poison baits from mill offals for the destruction of rabbits in such a way as to avoid the possibility of poisoning domestic stock are described.—D. C. B.

See also absts. 1150 (food poisoning); 1198 (human brucellosis from pigs); 1258 (Newcastle disease in man).

LIVESTOCK HYGIENE

JAKOBSEN, T. (1946.) Vandforsyningen paa Landet. [Supervision of water supplies in country districts from the veterinary hygienic viewpoint.]-*Maanedsskr. Dyrlaeg.* 53. 289-305. 1381

See also abst. 1411 (textbook of veterinary hygiene).

REPRODUCTION AND REPRODUCTIVE DISORDERS

SALISBURY, G. W., & BRATTON, R. W. (1948.) Fertility level of bull semen diluted at 1:400 with and without sulfanilamide.—*J. Dairy Sci.* 31. 817-822. 1382

In one experiment the practical limit of dilution rate was found to be 1:100, using the yolk-citrate diluent; in another (7,348 inseminations) there was no difference in fertility level between dilution rates of one part of semen to 100, 150, 200, 300, and 400 parts of the yolk-citrate-sulphanilamide diluent. The authors consider that the minimum number of spermatozoa consistent with optimum fertility is 5-10 millions per insemination.—W. R. BETT.

ANDERSON, H. W., & SEATH, D. M. (1948.) Effect of delay in diluting and cooling on keeping quality of bull semen.—*J. Dairy Sci.* 31. 551-555. 1383

Three 1 ml. samples were taken from each of 42 ejaculates from six dairy bulls. One sample was diluted and cooled immediately, another sample was diluted immediately and cooled 45 min. later, and a third sample was both diluted and cooled 45 min. after collection. Details of dilution and cooling are given. Semen quality was assessed by motility and methylene-blue reduction time after 24 and 72 hours storage at about 38°F. and motility following 15 min. incubation at 115°F. after 72 hours storage.

Results were examined statistically and a significant fall in quality was found both after 24 and 72 hours storage when either cooling only or both diluting and cooling were delayed 45 min. The fall was greater in the latter case.—E. J. H. F.

ALMQUIST, J. O., THORP, W. T. S., & KNOTT, C. B. (1948.) The effect of penicillin upon the livability, glycolysis, and bacterial content of bovine semen.—*J. Dairy Sci.* 31. 11-19. 1384

No decrease in motility of spermatozoa during a six-day storage period resulted from adding 250, 500, 750, or 1,000 Oxford units of penicillin per ml. of diluted semen. Higher levels were deleterious. Penicillin at all levels depressed glucose utilization and retarded bacterial growth.—W. R. BETT.

ALMQUIST, J. O., THORP, W. T. S., & GLANTZ, P. J. (1947.) The influence of streptomycin

The physical, chemical and bacteriological properties required of the water are given, and also rules governing the position and construction of different types of wells.—J. T. GREAVES.

upon the livability and bacterial content of bull semen.—[Abst. from abst. in *J. Dairy Sci.* 30. 542-543.] 1385

The addition of 2,500-10,000 µg. of streptomycin per ml. of diluted semen (1:24 yolk-citrate buffer) markedly reduced the ability of spermatozoa to maintain motility during storage. Analysis of variance involving 900 motility estimations, indicated no significant differences in viability of spermatozoa at levels of 100, 250, 500 750 and 1,000 µg. per ml. of semen.

Levels of streptomycin above 100 µg. per ml. of diluted semen inhibited the growth of bacteria. Freshly diluted semen without streptomycin contained an average of 5,000 bacteria per ml. as compared with an average of 120 per ml. for samples with added streptomycin.

Streptomycin was stable for 16 days in diluted semen stored at 4.5°C. as determined by assays with the standard cylinder plate method using *Bacillus subtilis* as test organism.

Streptomycin may be used (with penicillin) in controlling certain penicillin resistant bacteria sometimes found in semen.—A. W. MARRABLE.

WARWICK, E. J., CHILDS, C. E., FLOWER, A. E., & HAM, W. E. (1948.) Ram semen production and characteristics as influenced by administration of thyroprotein.—*J. Anim. Sci.* 7. 198-207. 1386

To determine whether lowered semen quality observed in rams in hot summer months was due to a thyroid deficiency, the following experiments were devised in Pullman, Washington.

Groups of from 3-5 rams were given thyroprotein daily for six weeks in doses ranging from 0.5-6 g. One experiment was carried out in spring (April, 1946) and two in summer (July, 1945, and July, 1946). In all cases semen was assayed for volume, motility, density and methylene blue reduction time at weekly intervals before, during and after treatment and quality compared with that of semen from control rams.

In the spring experiment quality of semen of treated rams was significantly lower than that of controls, the latter making a greater gain in weight than treated rams.

In the July, 1945, experiment there was no significant change in semen quality following

dosing, but in July, 1946, there was a slight improvement in semen quality of treated rams. In both summer experiments weight was lost during the first few weeks of treatment but regained later.—E. J. H. FORD.

JOHANSSON, K. I. (1948.) **Experiments with X-rays on cock sperms in regard to motility and fertility.**—*Acta agric. Suecana*. 1. 335–343. [Abst. in *Anim. Breed. Abstr.* 16. 64, copied verbatim.] 1387

Cock semen (Leghorn and White Wyandotte) with the addition of 4 parts of Ringer solution was exposed to X-ray doses of 305 r. to 24,000 r. with an intensity of 1220 r. per minute. Immediately after radiation no reduction in motility was observed in irradiated semen in comparison with the control, but after approx. 1 hr. a small reduction in motility occurred in semen receiving the largest dose of X-ray. The difference became very apparent after 3 hrs. A reduction in motility was also observed in semen receiving 12,200 r., and, in some cases, after radiation with 3050 r., but no reduction in motility could be seen after radiation with 305 r. and 610 r. Normal semen showed a much lower vitality-motility in a dilution of 0.001 than in one of 0.2. Insemination with semen irradiated with 610 r. resulted in the fertilisation of 18 out of 51 eggs; 9 of these produced living chickens. The 1220 r. semen fertilised 4 eggs out of 7, and the 2440 r. semen fertilised 5 eggs out of 19, but no chickens were hatched in either case.

DAVISON, W. F. (1948.) **Hormonal therapy in the treatment of sterility in the mare.**—*Irish Vet. J.* 2. 71–84, & 94–104. 1388

After a review of the literature D. deals with observations following the administration of pregnancy urine extract (P.U.), pregnant mares' serum (P.M.S.), horse pituitary extract (A.P.) and thyroid to a total of 73 pony, donkey and thoroughbred mares. There were 11 controls. Frequent rectal and vaginal examinations were carried out and teasers and stallions were used to detect oestrus. Details of individual treatment and results are given and the following main conclusions were reached:—administration of the hormonal products to anoestrous pony and donkey mares did not stimulate follicle formation. Silent heat, *i.e.*, ovulation without outward signs of oestrus is a breeding problem in thoroughbreds and a suggested line of treatment is the intravenous injection of stilboestrol. Thoroughbred mares treated with hormonal products during the breeding season came into oestrus as also did untreated control.—E. J. H. FORD.

SCHINCKEL, P. G. (1948.) **Infertility in ewes grazing subterranean clover pastures. Observa-**

tions on breeding behaviour following transfer to "sound" country.—*Aust. vet. J.* 24. 289–294. 1389

Declining fertility in sheep on Kangaroo Island occurring on recently improved pasture was characterized by clinical manifestations and pathology of the genital tract identical with that occurring on subterranean clover pastures in Western Australia. Sheep were moved from the affected area to "sound" country, namely pastures from which subterranean clover was absent. Prolapse of the uterus which had occurred on the affected area did not take place. Infertility persisted but dystocia, which occurred at the first lambing on sound country, did not occur at the second lambing. Attention is drawn to early post-natal deaths of lambs as a common accompaniment to the usual uterine prolapse-dystocia-infertility complex in this condition.

Uterine prolapse occurs only when ewes are ingesting highly toxic material whereas dystocia and infertility persist after the cessation of ingestion of such material. A dystocia complex may occur with uterine inertia as the basis and variations in the degree of inertia may cause variations of symptoms:—extreme inertia causing retention and mummification; moderate inertia causing delayed parturition, displacement and dystocia; mild inertia causing anoxaemia of the foetus resulting in stillbirth or early post-natal death of the lamb.

A cystic endometrium was not present in all infertile ewes and was present in three ewes which had borne lambs. Infertility may be due to failure of implantation rather than to failure of fertilization.—D. C. BLOOD.

BARTON, M., & WIESNER, B. P. (1948.) **The role of special diets in the treatment of female infertility.**—*Brit. med. J.* Nov. 13th. 847–851. 1390

The authors discuss 88 cases of infertility associated with cervical infection (cervical block) in overweight women aged 30–40.

All patients were put on a sucrose-free diet. In 14 cases the diet was supplemented by three oz. lactose daily and in nine cases by sugar-free foods of equivalent or greater calorific value than the excluded sugared foods. In all groups a large proportion of patients lost weight and in many of these cases the cervical infection responded to oestrogen or antibiotic treatment which had been ineffective before dietary changes. The results may be related to loss of weight and also to alteration of intestinal flora.—E. J. H. FORD.

BROWN, R. O. (1948.) **The biological aspect in treatment of the infertile marriage.**—*Brit. med. J.* Nov. 13th. 851–853. 1391

From the results of endometrial biopsies of

human subjects B. considers that imperfect nidation of the fertilized ovum is a common cause of infertility.

Treatment is carried out by administering 0.6 mg. "dienoestrol" and 10 mg. "ethisterone" daily from the first fertile date for 18 weeks unless menstruation should commence.

See also absts. 1140 (staphylococcal abortion in cattle); 1175 (*Corynebacterium pyogenes* in bull semen); 1283-1285 (haemolytic disease of new born animals); 1371 (fructose in semen); 1372 (placentome of the cow); 1373-1377 (semen and spermatozoa).

ZOOTECHNY

KELLEY, R. B. [D.V.Sc., Animal Geneticist, Council for Scientific & Industrial Research; Officer-in-Charge, the F. D. McMaster Field Station]. (1946.) **Principles and methods of animal breeding.** pp. viii + 296. Sydney: Angus & Robertson Ltd. 15s. 1392

This book is based on a series of lectures on animal breeding given at a refresher course for graduates and agricultural officers at the Veterinary Faculty of Sydney University. K.'s object has been to put forward a concise story of animal breeding associating the established practices of breeders with biological precepts and he has succeeded in producing a stimulating account of interest both to breeders and to more academic workers. The first six chapters examine the methods used by the great breeders of the past which resulted in the development of the Short-horn, Aberdeen Angus and Hereford breeds of cattle and of the thoroughbred and other breeds of horses. Here the methods are illustrated by the use of many pedigrees of notable individuals in the various breeds. Throughout this section the influences which K. calls the secondary environmental factors, which were the driving forces behind the breeders, are stressed. The industrial revolution led to a clamorous demand for animal products for food and the introduction of turnips and clover into English agriculture made it possible to sustain quicker growing and improved types of livestock.

The existing stocks were very heterogeneous and afforded wide scope for selection. Having selected the types required the next step was isolation of the select group and was generally enforced by the establishment of stud books. This stage K. calls the constructive period. From this he passes on to biological consideration and then to an exposition of genetical principles and their influence on the development of modern breeding practices. One of the most interesting chapters deals with animal breeding in Australia, particularly with the history of the development of the Australian Merino. Here again economic factors have had a powerful influence. The great English wool trade was ruined after the Napoleonic wars by competition from cheap German wool.

Under the above treatment out of 111 cases not previously pregnant 38 became pregnant in six months and out of 38 cases of repeated miscarriage 28 became pregnant in six months.

The same treatment is recommended in cases of infertility where the semen is considered to be inadequate.—E. J. H. FORD.

When the German wools dominated the markets the first consignments of wool from Botany Bay arrived in 1807 and were treated as a jest by the merchants, but by 1840 Germany was beaten and eventually in 1845 Australian wool was actually imported by German merchants. There are chapters devoted to artificial insemination, progeny-testing, and current research. Coefficients of inbreeding are dealt with in an appendix and there is a useful glossary of terms and a bibliography.

All connected with the breeding of livestock will find much of value in this book.—M. C.

BRODY, S., RAGSDALE, A. C., & THOMPSON, H. J. (1948.) **The influence of body size of dairy cattle on their reaction to high ambient temperatures.**—*J. Anim. Sci.* 7. 539-540. [Authors' abst. copied *verbatim*.] 1393

Remarkable difference in the reactions of individual dairy cows to ambient temperatures above 75°F. were observed in the Psychroenergetic, or Climatic, Laboratory, Columbia, Mo. Many factors are involved in body temperature regulation of which body size appears to be important. The curves relating rectal temperature, milk production, feed consumption body weight and some cardiorespiratory activities to ambient temperatures indicate that thermal distress begins at lower temperatures and increases at higher rates with increasing ambient temperatures in large than in small cows. This is not unexpected because heat dissipation is by way of the body surfaces; and since the amount of surface per unit body weight decreases with increasing body weight, the rate of heat dissipation per unit weight slows down with consequent earlier and steeper rise in body temperature in large than in small animals. The critical temperature—that is, the temperature which begins to exert a definitely depressing effect on the productive process—is 5° to 10°F. lower for the large (75 to 80°F.) than for the small (80 to 85°F.) cows. A particularly dramatic, but perhaps fortuitous, event was the abortion of 4½ and 6 month fetuses by two of the largest animals (with the highest rectal temperatures) 2 to 3 days after a 30-hour exposure to a 100°F. temperature. Is

it possible that the abortions were caused by the thermal death of the fetus? All were Brucellosis free. Perhaps unexpected was the rise in the milk fat percentage with rising temperature, that is, with declining milk yield, especially in the large cows. The possible involved neuro-endocrine mechanisms will be outlined.

SHANKS, P. L. (1948.) **The farrowing crate.**—*Vet. Rec.* 60. 478-479. 1394

A plan and full constructional details are given of a suitable farrowing crate. The management of the brood sow in such a crate is outlined and its advantages are briefly discussed.—D. LUKE.

MONTGOMERY, I. W. (1945.) **The Northern Territory.**—*Aust. vet. J.* 21. 129-137. 1395

These are notes on history, population and
See also abst. 1416 (the grasslands of Latin America).

TECHNIQUE AND APPARATUS

DUNPHY, D. L., & FOUSEK, M. D. (1947.) **A simple medium for growth of tubercle bacilli.**—*Yale J. Biol. Med.* 19. 1013-1015. [Summary copied *verbatim*.] 1396

A medium of human blood and glycerin was found to support the growth of virulent tubercle bacilli. The medium appears to have the advantages of speed and simplicity.

VERA, H. D. (1948.) **A simple medium for identification and maintenance of the gonococcus and other bacteria.**—*J. Bact.* 55. 531-536. [Author's summary copied *verbatim*.] 1397

A simple autoclaved semisolid medium containing pancreatic digest of casein, cystine, and sodium sulfite provided a suitable substrate for the cultivation of freshly isolated gonococci. For the development of cultures in this medium, incubation in an atmosphere reinforced with carbon dioxide was not obligatory. Gram-negative and gram-positive cocci, brucellae, and diphtheria bacilli could be maintained indefinitely by relatively infrequent transfers. Accurate fermentation reactions with appropriate carbohydrates were obtained promptly with freshly isolated strains of *Neisseria* and other organisms.

HOUSEWRIGHT, R. D., HENRY, R. J., & BERKMAN, S. (1948.) **A microbiological method for the assay of subtilin.**—*J. Bact.* 55. 545-550. 1398

A detailed description is given of a filter paper disc method for the microbiological assay of subtilin, using *Bacillus cereus* 247 as the test organism: the error of the assay by the method described was $\pm 5-10\%$. The maximal activity of subtilin occurred when the pH of the medium was 5.9, there being a gradual decrease in activity as the pH was increased to 7.2. pH 6.4 was chosen for routine assay since this permitted a

stock figures, rainfall and climate, soils and pastures, land tenure, natural land divisions, animal husbandry, stock diseases, economic aspects and developmental projects of the Northern Territory of Australia.

Cattle raising is the chief industry of this tropical and semi-tropical region which supports over 900,000 cattle, 30,000 horses and 38,000 sheep. Considerable improvement is required in animal husbandry. The more important diseases are bovine TB., contagious pleuro-pneumonia, cattle tick (*Boophilus*) and tick fever and buffalo-fly *Siphona*. "Walkabout disease" in horses causes huge losses. Its aetiology is undetermined, but cirrhosis of the liver, nervous symptoms and heavy infestations with nematode parasites accompany the disease.—H. McL. GORDON.

margin of safety in the adjustment of the pH of the medium during its preparation. The test organism did not grow when the medium contained 5% of NaCl, but lower concentrations of salt had the effect of increasing the diameter of the zones of inhibition of the organism. The method was also applicable to the assay of subtilin in certain body fluids, and it was found that within certain limits, in the presence of a constant amount of subtilin, the diameter of the zone of inhibition was dependent on the amount of blood and serum present. The assay of subtilin was not affected by the presence of normal urine in concentrations up to 50%.—CLIVE BRIGGS.

MAY, K. R. (1945.) **The cascade impactor: an instrument for sampling coarse aerosols.**—*J. sci. Instrum.* 22. 187-195. [Abst. in *Bull. Hyg., Lond.* 21. 244, copied *verbatim*. Signed: C. N. DAVIES.] 1399

This instrument was evolved during the war for the field sampling of airborne clouds of toxic particles or droplets in chemical warfare research. Conditions were such that a cloud would pass over the sampling line in about half a minute, during which time the impactor collected, and fractionated into four size-groups, sufficient of the active material for microscopic or microchemical examination in the laboratory. A rapid assessment of the relative quantities in the four size-fractions was often all that was required, and hours of tedious work at the microscope were therefore saved.

The team of workers responsible for the physical sampling of toxic clouds developed various techniques for obtaining quantitative results, whatever might be the nature of the dispersed material. Some of these methods are described in this paper.

Applications were made to air-borne bacteria, to internal combustion engine exhaust gases and to the analysis of impregnated carbon dust in the air of respirator-filling factories, amongst others mentioned in the paper. Hence it will be appreciated that this should be a useful tool in the fields of industrial and public health. The salient characteristics are: (a) the instrument takes a quick sample; and (b) unlike most dust counters, it is effective over a very wide range of particle sizes. It is to be hoped that the inventor will arrange for the manufacture of this instrument so that it will be available to those who are concerned with air hygiene.

The author quotes, correctly, the conditions for dynamical similarity of particle trajectories in an impaction system of the type used in his instrument, but in applying the formula to the estimation of impaction efficiency in general, from his own experimental results, he neglects the fact that his four jets are not even geometrically similar, for example the first two throw all the flow to one side. This is not evident from his curve because it is obtained by averaging the results for all four jets. Plotting similar curves for the individual jets reveals up to threefold differences in efficiency. The general theoretical discussion is therefore inadequate.

PENCE, R. J. (1947.) **A simple device to increase background contrast in photomicrography.**—*Science*. 105. 508–504. 1400

A small, black, cylindrical box (about one and a quarter of an inch in diameter and three-quarters of an inch deep) with interior walls of low reflective power and a black paper lid with a small circular hole at the centre, is placed above the condenser lens and just below the specimen to be photographed.—E. PARKER POLLARD.

PFEIFFER, C. C., JENNEY, E. H., & WILLIAMS, H. L. (1947.) **A dermal plethysmograph for the recording of skin-whealing reactions.**—*J. Lab. clin. Med.* 32. 1887–1893. [Authors' summary copied *verbatim*.] 1401

A dermal plethysmograph [whealometer] has been constructed which measures with a known degree of accuracy the growth and disappearance rate of dermal wheals. Wheal measurement is suggested as a useful procedure for the study of histamine response or other immediate whealing responses and for the determination of the rate of disappearance of various substances injected intradermally.

ANON. (1948.) **Metal caps for test tubes.**—*Nature, Lond.* 162. 920. 1402

It is claimed that test-tubes closed with metal caps instead of with cotton wool remain sterile for long periods. The tubes and caps can be sealed with cellophane. The caps are supplied in sizes to fit test-tubes with outside diameters of five-eighths, three-quarters and one in. and the advantages of their use are described.—M. W.

MISCELLANEOUS

McELLIGOTT, M. [F.R.C.S. (Ireland), D.P.H.; Sometime Regional Medical Officer of H.M. Ministry of Health]. (1946.) **Spanish-English medical dictionary.**—pp. viii + 250. London: H. K. Lewis & Co., Ltd. 8vo. 12s. 6d. 1403

This little book, which is of convenient pocket size and is unpretentiously referred to by the author as a "vocabulary", has been carefully compiled and contains 14,000 medical, veterinary and scientific terms, the English orthography used being that of the Oxford English Dictionary. The author states that he searched both the Spanish

and South American literature to make a selection of terms to be included. A separate list of veterinary terms compiled by Isobel W. Brocklehurst, M.R.C.V.S., of the Department of Veterinary Pathology, University of Liverpool, is included at the end of the book.

While the book is intended for the Spanish-speaking medical world, it will no doubt be of value also to veterinary as well as medical research workers in all the English-speaking countries. It is clearly printed on good quality paper and well bound, and the price is reasonable.—F. E. W.

REPORTS

ANON. (1947.) **Report of the expert committee on biological standardization.**—*Bull. World Hlth. Org.* 1. 7–21. 1404

The functions of this committee are mentioned briefly. The setting up of new biological standards, the acceptance of provisional standards established during the war in London and Copenhagen and the replacement of standards are discussed.—MARCUS S. BROOKE.

AUSTRALIA. (1947.) **Eleventh annual report of**

the Australian Wool Board for the year 1946–47. pp. 81. Items of veterinary interest, pp. 25–29. 1405

There is a general review of the work of the Wool Board in the fields of advertising and wool-use promotion. There are notes on technical research carried out in England.

The results of pastoral research carried out by the Australian Council for Scientific and Industrial Research, with funds provided by the

Wool Board, are presented for the information of sheep owners.

Field trials were in progress on the comparative value of various surgical operations to the breech region and tail in preventing BLOWFLY STRIKE. The association between fleece-rot and body strike was confirmed. Fleece-rot was more prevalent among sheep with dense wool than among those with very slack, open fleeces. Further tests of lamb-marking dressings confirmed the value of boric acid-bentonite-oil of citronella mixtures and indicated that for best results not more than 100 lambs should be treated from each one gal. of the material. Spraying the tail and crutch with pure oil of citronella, citronella oil from which most of the geraniol had been removed, or dibutyl phthalate, all at about 2.5 ml. per lamb, gave similar degrees of protection to the boric acid-bentonite-oil of citronella mixture.

A dipping fluid containing 0.1% D.D.T. eradicated KEDS from newly-shorn sheep and woolly lambs. At a concentration of 0.03% D.D.T. infestations persisted in woolly lambs, probably due to poor wetting.

The life-cycle of the FOOT-LOUSE (*Linognathus pedalis*) was studied on the sheep, with the following findings: Deposition of egg to hatching, 14-15 days; first stage larva to adult, 16-17 days; preoviposition period, five days; egg to adult, 30-32 days; rate of egg production, one per day.

Sheep maintained on a high plane of nutrition threw off their infestations with KEDS and BODY LICE in three months while sheep on a low plane of nutrition had increasing parasite populations.

Heavy rains early in the year resulted in rapid growth of subterranean clover in south-eastern Australia and there were many outbreaks of TOXAEMIC JAUNDICE. There were no losses on grass-dominant pastures. Deaths occurred in one-year-old sheep, suggesting that the animals' previous history was unimportant and that a high copper status in the liver was built up during a period of three months. Among sheep grazing on heliotrope (*Heliotropium europaeum*) during summer months there was a greater mortality rate than among sheep which had not grazed heliotrope.

Although much remains to be learned about the cause of the high copper status acquired by sheep in some conditions, a working hypothesis is advanced:—(a) acid soils depress the uptake of molybdenum and favour the uptake of copper by plants; (b) changing climatic conditions at times favour a more acid state of the soil and the growth of herbage rather than grasses; (c) certain species of herbage plants have a low avidity for molybdenum; (d) because the copper status of the sheep

depends largely on the ratio of copper to molybdenum in its diet, when the molybdenum is relatively low a high copper status in the animal is favoured.

A list of recommendations is given for control of TOXAEMIC JAUNDICE DUE TO COPPER POISONING.

INTERNAL PARASITES. Observations on SELF-CURE FROM HELMINTH PARASITE INFESTATION showed that sheep have no appreciable resistance to infection at the time "self-cure" is manifested and that the phenomenon is of very short duration. Present indications are that it may be an anthelmintic effect rather than a form of immunity or resistance.

Studies on phenothiazine showed that doses from 2.5 g. to 12.5 g. injected into the rumen reduced the egg count but did not kill high proportions of *Haemonchus contortus*. Anthelmintic efficiency against *Trichostrongylus* spp. increased as the dose rate was increased to 50 g. and beyond, and it is recommended that in practice the dose rate should not be less than 25 g. for sheep 10-12 months old.

Larvae of *Oesophagostomum columbianum* continued to emerge from the bowel wall for at least 12 months after infestation occurred.

Observations on winter feeding of weaned lambs were continued at Armidale, N.S.W. Those grazed on green oats continuously from May to September gained over 26 lb. per head, threw off their infestations with *Oesophagostomum columbianum* and none died. Similar sheep given access to green-oats grazing for 2-3 hours per day and natural pastures for the rest of the time gained 1.3 lb., cut 2 lb. less wool per head than the continuous-oats group and did not throw off infestation with *Oes. columbianum*. Among groups on natural pastures there were mortality rates of 12 to 50%.

That the influence of adequate feeding of weaned lambs persisted was shown by studies on the sheep from the 1945 trial which were observed during 1946. Sheep grazed on green oats during their first winter cut 1 lb. 10 oz. more wool and weighed 9 lb. more per head in their second year than those grazed on natural pastures.

Studies on the intermediate host of the LIVER FLUKE, the snail *Lymnaea brazieri*, showed that of a number of chemical compounds only zinc sulphate was markedly toxic and it was but half as toxic as copper sulphate, the compound commonly used for killing the snail. In some natural waters the toxicity of copper sulphate was reduced. Rabbits often carry heavy infestations with *Fasciola hepatica*.

A complement fixation test has been developed and is of value in following the rise and decline of resistance of sheep to WORM PARASITES.

DISTURBANCES OF REPRODUCTION are produced in pastures in Western Australia in which an early strain of subterranean clover is dominant. An oestrogenic substance is present in the clover.

In order to contrast various systems of animal breeding a series of comprehensive, long-term trials with sheep have been planned. The chief systems under study are the Australian Mass Selection, the Hagedoorn Nucleus, and the Family System of the Bureau of Animal Industry (U.S. Dept. of Agriculture).

Other breeding investigations concern **INHERITANCE OF SKIN WRINKLES**, inbreeding of Merino sheep and **POLLEDNESS** in Merino sheep.

In southern latitudes sunlight lacks effective ultra-violet rays for several weeks during winter. Under these conditions young sheep in New Zealand have benefited from supplements of **VITAMIN D**. Trials have been designed to test the value of vitamin D in Tasmania and Southern Australia.

Sheep at Gilruth Plains in South-Western Queensland did not benefit from access to a **SALT LICK**.

Studies on the **TOXICITY OF WHEAT** for sheep and horses showed that anti-histamine drugs did not prevent untoward effects in animals which had gorged on wheat.

Under the variable seasonal conditions experienced by sheep on pasture the rate of wool production was found to vary by as much as 250 %, reflected mainly in change in fibre diameter. A daily supplement of 1-2 oz. of protein for grazing sheep gave economical returns in increased wool production.

Other investigations mentioned in the report deal with wool production factors in Camden Park Merinos and Corriedales at different levels of nutrition, improved methods of measuring certain wool characters, field trials with pastures, and pasture management.—H. McL. GORDON.

CANADA. (1947.) Report of the Veterinary Director General for the year ended March 31, 1947. [CHILDS, T.] pp. 41. Ottawa: E. Cloutier. 1406

The Dominion has remained free from the more serious animal plagues. Staff shortages have limited the scope of the work of eradicating **BOVINE TUBERCULOSIS** and **BRUCELLOSIS**.

The one outbreak of **ANTHRAX** was controlled by vaccination of the 27 cattle in contact. Three of the cattle died.

302,656 cattle were tested for **TUBERCULOSIS** under the accredited herd plan and 0.2 % reacted. Under area testing 411,652 cattle were tested and 0.7 % reacted. Under the supervised herd plan out of 40,980 tested there were 0.4 % reactors. All reactors are slaughtered. 2,681 herds are

supervised and 1,779 herds are free from **BRUCELLOSIS**. **SWINE FEVER** occurred on two premises in the province of Ontario and 44 pigs were slaughtered.

There were no outbreaks of **GLANDERS**, **DOURINE**, **SHEEP SCAB**, **SCRAPIE**, **RABIES**, **FOWL PLAGUE** and **PNEUMO-ENCEPHALITIS (NEWCASTLE DISEASE)**.

One hundred and eight food production establishments are being inspected. There was a staff of 400 employed during the year. There was a 9.02 % decrease in the total number of animals slaughtered, which amounts to 904,601. Two plants are engaged on horse slaughter. The total of animals slaughtered was 9,122,496 made up of cattle and calves 2,272,481 (-11.66 %), sheep 1,170,786 (-5.01 %), pigs 3,991,490 (-20.69 %), poultry 1,636,919 (+38.67 %), horses 50,560 (+540.40 %). Percentages of carcasses condemned were as follows:—cattle 0.80 %, calves 1.74 %, sheep 0.43 %, pigs 0.28 %, poultry 1.61 % and horses 0.46 %.

Of calves slaughtered 60.86 % were male and 39.14 % were female.

Only two animals infected with **EQUINE SCABIES** were found. Outbreaks of **BOVINE SCABIES** occurred in the Provinces of Nova Scotia (48 head), Ontario (28 head), and Alberta (four head).—J. A. GRIFFITHS.

U.S.A. (1947.) The Rockefeller Foundation. A review for 1947. [FOSDICK, R. B.] pp. 64. New York: The Rockefeller Foundation. 1407

It is not possible to summarize adequately this review of the activities of this liberal organization.

In 1947 representatives of the Rockefeller Foundation visited every country in the world except Bulgaria and the Soviet Union. During the year \$21,450,000 were distributed. Of this 39 % was expended for work in the U.S.A. and 61 % for work in other countries. The distribution was in seven categories:—Public Health \$2.25 million, Medical Sciences \$1.5 m., Natural Sciences \$1.7 m., General Education Board \$1.5 m., China Medical Board \$10 m., Social Sciences \$3 m., Humanities \$1.5 m.

Since V.J. Day the Rockefeller Foundation has distributed over \$5.5 m. for various activities in the war-crippled countries. The aim has been first to get research restarted by providing equipment to Universities, Libraries and Research Centres and second to re-establish the contacts of these institutions with each other and the rest of the world. All five divisions of the Foundation have participated, *i.e.*, Natural Sciences, Medical Sciences, Humanities, Social Sciences and Public Health. The largest grants were made in Great Britain, France, Denmark, Holland, Norway,

Sweden and Switzerland with smaller grants in nine other countries. The problem in Germany has been studied. The extent of the poverty in Germany impressed the Foundation's observers. "To the German, hunger is a constant companion. Not until his standard of living is raised to a decent level can the German possibly contribute to the creation of a peaceful, democratic society." The largest contribution in 1947, \$10 m. was made by the Foundation to the China Medical Board Inc., which was created in 1914. Its activities have done much to spread medical knowledge through the graduates of Peiping Union Medical College.

In Public Health a survey was made by the International Health Division of the Foundation on the development of ideas in the British Commonwealth countries and Denmark, Finland, Holland, Norway, Sweden and Switzerland. The report made by Dr. J. H. Grant "shows a trend toward a broader distribution of the benefits of modern medicine than hitherto has been thought practicable, at least in the U.S.A."

Encouragement has been mainly to two outstanding institutions in the U.S.A. which emphasize the applications of basic science to biology, *i.e.*, The Massachusetts Institute of Technology and the California Institute of Technology, the former dealing largely with the relations of physics to biology, the latter with the application of chemistry.

In England grants were also made to W. T. ASTBURY, Professor of Biomolecular Structure at the University of Leeds, and to J. T. RANDALL, Director of the Biophysics Research Unit of King's College, University of London.

THE UNITY OF SCIENCE. The fragmentation of knowledge into unco-ordinated specializations has long been recognized as one of the chief evils of modern scholarship. An Institute for the unity of Science has received a charter in New York State. The Rockefeller Foundation made a grant in support of its work in 1947. It is at present highly experimental but it has genuine promise in leading toward a deeper integration of human knowledge and culture.

A total of 2,510 applications for financial aid were made and of this total 43% were rejected, mainly because "they fell outside the interests of the Foundation."

The Review is well worth a perusal.—J. A. G. U.S.A. (1947.) **Los Angeles County Livestock Department, California.** Twenty-third annual report, fiscal year ending June 30, 1947. [HURT, L. M.] pp. 48. Los Angeles, Calif.: County Livestock Department. [Mimeographed.] 1408

The number of dairy cattle increased by 8.1% to 131,614. In tuberculin tests of 28,160

cattle there were 0.184% reactors. The incidence of MASTITIS in dairy cattle is said to be 40% to 50%. This situation is being dealt with by the application of hygienic measures including the segregation of infected cows. (The measures being applied appear to depend on voluntary effort by the dairymen themselves.)

Although vaccination against BLACKLEG is practised there were five deaths from the disease in young vaccinated animals.

MENINGO-ENCEPHALITIS of cattle occurs in an acute form. The cause is not known. In one herd of 200 head 14 cattle died after the appearance of symptoms, but no cause could be found. P.M. Mouldy hay had been fed to the herd and they also drank from stagnant water which contained algae and bacteria. (A further investigation of similar outbreaks would appear desirable.)

ANAPLASMOSIS appears to be a cause of losses among young cattle in some herds.

LUNGWORMS (*Dictyocaulus* infection) caused losses in some herds.

There were no cases of scabies diagnosed but ringworm and lice infestation were observed occasionally.

MISCELLANEOUS CONDITIONS include castor bean poisoning affecting a herd of 102 dairy cows. This followed the use of walnut meal milled in the same machine in which castor bean had been milled.

The Sheep Industry has declined since 1940, the numbers of sheep being 50% less. This is due to the gradual decrease of the land available for pastures. Among conditions causing losses were COCCIDIOSIS and "STOMACH WORMS". COPPER POISONING caused the loss of 70 lambs in a consignment of 1,100 lambs brought in from Idaho. The source of the copper was not discovered. Lesions noted included icterus, infarcts in the lungs, spleen and liver enlarged, bile turbid, contents of caecum and colon putrid, the kidneys were nearly twice the normal size and engorged with blood. There was acute cystitis in the bladder which contained a viscid blood-stained urine.

Four clinical cases of EQUINE ENCEPHALITIS were reported by the State Virus Laboratory to be negative.

There is a total of 59,000 pigs. Of these 50,000 are fed swill.

An outbreak of SWINE ERYSIPELAS occurred on one ranch. Pigs of all ages became infected. Some deaths from SALMONELLOSIS occurred. *Salmonella ruzendorf* was isolated by the laboratory. Segregation, sanitary measures and treatment with sulphathalidine have been useful in controlling the disease.

VESICULAR EXANTHEMA occurred on 13

ranches. The lesions are identical with foot and mouth disease in pigs, but the disease is not transmissible to cattle. The position is complicated owing to the prevalence of foot and mouth disease in Mexico, the neighbouring State. SWINE FEVER causes most of the losses after weaning age. Pigs are immunized by the use of virus and serum. The potency of the virus is often suspected.

"THREE DAY DISEASE" of new-born pigs appears to be due to malnutrition through lack of milk from the sows. The losses occur within ten days of birth.

6,129 P.M. examinations of poultry were carried out, 25% fewer than the previous year. Specimens received for examination were 1,744, a decrease of about 27% and diagnoses were 2,611, a 13% decrease. PNEUMO-ENCEPHALITIS appears to be identical with "Newcastle disease" in many respects. The mortality is low and adult birds recover rapidly. Carriers of FOWL CORYZA (birds recovered from previous outbreaks) spread the disease. Sulphathiazole 0.75% in the mash is recommended for treatment. Vaccination by the bunch method is recommended for LARYNGO-TRACHEITIS. CHICK BRONCHITIS, a virus disease which affects young birds, is stated to be "difficult to differentiate . . . from Pneumoencephalitis" particularly when nervous symptoms are absent. INFECTIOUS SINUSITIS occurs in a few turkeys. It is suggested that the caseous contents should be removed surgically and the sinuses injected with a solution of silver nitrate or argyrol. FOWL POX is controlled by vaccination. It is recommended that birds should be re-vaccinated if there is no reaction to the original vaccination. PULLORUM DISEASE has dropped to second place in the numbers of cases diagnosed at the Poultry Laboratory. Sulphamerazine three-quarters *per cent.* in the food mash is recommended during the course of an outbreak. This treatment does not prevent recovered birds acting as carriers. It is of no value when the outbreak is already causing serious losses.

SALMONELLA INFECTION occurs in chickens and turkeys. It is a serious cause of losses even in newly opened up ranches in desert areas. Rodents and reptiles are now known to be carriers. The visceral type of LYMPHOMATOSIS affecting the liver is most commonly found P.M. The neural type is also common. A few cases of "grey eyes" and the type called "osteopetrotic", where there is abnormal bone growth, have been diagnosed. BOTULISM occasionally causes losses among turkeys. In one outbreak the cause was traced to the use of infected canned beans. A few outbreaks of FOWL CHOLERA occurred among turkeys.

FEATHER MITE INFESTATION was unsuccessful

fully treated by the application of "black Leaf Forty" to the roosts but an ointment of this preparation applied several times to the birds was apparently successful.

Sulphaguanidine (fed 1% in the mash) is effective in treatment of COCCIDIOSIS provided that sanitary precautions are adequate, including the use of wire mesh floors. The sanitary measures recommended for the control of coccidiosis are also effective for the control of TAPEWORM and ROUNDWORM INFESTATIONS.

In g. pigs BALANTIDIOSIS, TRICHOMONIASIS, STREPTOCOCCUS and STAPHYLOCOCCUS INFECTIONS and VITAMIN C DEFICIENCY were common. In rabbits FAVUS (also in persons handling rabbits), PASTEURILLOSIS, possibly endemic, MUCOID ENTERITIS and MYXOMATOSIS. In mink URINARY CALCULI and "DEGENERATED LIVERS" which are said to be caused by dietary errors. Some mink farms have trouble with tartar accumulation on the teeth which has to be removed to prevent losses through STOMATITIS followed by anorexia and death from starvation. The cause is not known. In chinchillas *Pseudomonas pyocyanea* appears to be an important pathogen. On one ranch it was recovered from 100% of the fatal septicaemias of the new-born; also from abscesses, pneumonias and septicaemias of adults and in enteritis and rectal eversion.—J. A. GRIFFITHS.

U.S.A. MASSACHUSETTS. (1946.) *Annual report for the fiscal year ending June 30, 1946. Massachusetts Agricultural Experiment Station.*—*Bull. Mass. agric. Exp. Sta.* No. 436. pp. 70. Items of veterinary interest pp. 15-16, 64-66. 1409

In 1944-45 tests of the feeding of synthetic thyroprotein to dairy cows there was a consistent decrease in casein and an increase in lactalbumin and globulin. Changes in fat content were not consistent. The experiment was repeated in the winter of 1945-46 and similar results were obtained. The tendency for the casein to be reduced was still apparent, but there were wide variations in the composition of the milk even in individual cows of the same breed. There was loss of bodyweight at first, but after a few weeks this increased again slowly even while the hormone was being fed. In general pulse and respiratory rates were increased.

In a small experiment to test the effect of vitamin D on the incidence of MILK FEVER, six cows were fed one million units of vitamin D—as irradiated yeast—daily for one month before calving. Five of them did not develop MILK FEVER. Three out of four of these cows, when used as controls subsequently, developed milk fever. One susceptible cow which resisted milk fever in two lactations, when fed the irradiated

yeast, broke down in the next lactation when used as a control.

PULLORUM tests gave 0.12% reactors in 1,259,623 tests.

4,731 specimens were examined by the diagnostic service. Of these, 4,180 were of poultry; COCCIDIOSIS, TUMOURS, PULLORUM DISEASE, INFECTIOUS BRONCHITIS and FOWL PARALYSIS were the diseases most frequently encountered. The tumours were classified as lymphocytoma 31, myelocytoma 14, leucosis 8, haemangioma 6, carcinoma 4, embryonal nephroma 4, leiomyoma 2, myxoma 2 and fibroma, hematoma, melanoma and neurogenic sarcoma, one of each. Two tumours were unidentified. Other diseases diagnosed included AVIAN TUBERCULOSIS which occurred in three flocks, FOWL TYPHOID 14 cases, FOWL CHOLERA in chickens 25 cases and also cases in turkeys, ducks and a robin. NEWCASTLE DISEASE, ten cases were confirmed. POISONING cases included poisoning by arsenic, coal tar, creosote oil and derivatives, salt, coca bean, kerosene, naphthalene and phosphorus.

The problem of INFECTIOUS BRONCHITIS was complicated by the diagnosis of NEWCASTLE DISEASE in Massachusetts in November, 1945. A survey is in progress to determine the distribution of the two diseases.—J. A. GRIFFITHS.

U.S.A. WASHINGTON. (1942.) **Report of agricultural research and other activities of the Western Washington Experiment Station for the fiscal year ended March 31, 1942.** [KALKUS, J. W.] pp. 70. Puyallup, Washington. Items of veterinary interest pp. 50-68. 1410

Disease Resistance Experiments included poultry experiments carried on with various strains of poultry resistant to LEUCOSIS. There was a distinct difference in both total mortality and LEUCOSIS mortality between Cornell Resistant and Susceptible Lines raised on the station.

Results of experiments on the control of AVIAN LEUCOSIS showed that it was necessary to keep chicks segregated from older birds and contaminated premises until just prior to egg production.

The large doses of sulphathiazole required to effect a cure of INFECTIOUS CORYZA in chickens make the treatment uneconomical except in valuable breeding stock; 5-6 g. of sulphathiazole are needed to effect a cure. This is given in 1 g. doses night and morning in 30 g. of mash. Only three birds were treated and two recovered.

A delousing leg band said to be charged with nicotine sulphate 14.4%, naphthalene 21%, oil of tar 12%, and inactive ingredients 52.6%, was tested with 174 infected and 25 clean birds. It failed completely either to cure infected birds or to prevent infestation of clean birds.

Of 115,000 chickens tested for PULLORUM DISEASE about 0.85% were infected; of 30,270 turkeys only 0.11% were infected.

Variations in the salt ration above that normally fed do not appear to affect the development of feather picking or cannibalism. Cannibalism mortality in groups of 70 laying birds was 5% in those fed $\frac{1}{4}$ % salt in the ration, 17.9% in birds fed 3% salt and 7.9% in birds fed $\frac{1}{4}$ % salt with 10% of the corn replaced by epsom salts.

1,216 specimens were examined from 672 cases of disease in poultry. There were no cases of TUBERCULOSIS, FOWL CHOLERA or FOWL TYPHOID. COCCIDIOSIS amounted to 18% of the total. There were 23% LEUCOSIS, including paralysis, tumours, marble bone, enlargement of internal organs and gray eye.

Eight cases of ERYSIPELAS in turkeys were reported in three years. It is apparent that many outbreaks had remained undiagnosed. The use of formolized turkey serum in 3 ml. doses appears to have some value. 83% of the birds treated recovered. The disease was transmitted to healthy turkeys from cultures on chick embryos of *E. erylipelothrix rhusiopathiae* recovered from the diseased birds. The material commonly used for inoculating embryos consists of the chorio-allantoic membrane of a chick embryo previously inoculated with the organism, triturated with 5 ml. Locke's solution. One ml., when inoculated into the body cavity of healthy turkeys killed them within 3-5 days.

In turkeys there was breakdown of immunity after one vaccination against FOWL POX and it is recommended that the turkeys should be vaccinated at 11 weeks and that those for breeding be re-vaccinated a month before the breeding season.

One hundred and sixty-six specimens from 80 birds were examined bacteriologically. ENTERITIS of unknown aetiology caused most of the deaths. In the majority it is due to dietary mismanagement. Up to six months of age COCCIDIOSIS is the main cause of losses.

16,805 blood samples were tested for BOVINE CONTAGIOUS ABORTION. Approximately 4.9% were positive and 7.29% suspects.—J. A. G.

BOOK REVIEWS

DAHMEN, H. [Dr. Med. Vet., O. Prof. A. D. Friedrich Wilhelms-Universität Berlin. Direktor des Instituts für Veterinär-Hygiene.] (1944.) *Lehrbuch der Veterinär-hygiene.* [Textbook

of veterinary hygiene.] pp. viii + 295. 62 illustrations. Berlin: Paul Parey. 2nd revised Edit. 1411

This is a comparative newcomer to the list

of German veterinary manuals, designed for essential instruction of students and for reference by practitioners, as the first edition appeared only in 1941. This second edition does not differ materially from it except in layout, but some new matter has been incorporated.

Sections are devoted to sunlight, ground, air, climate, water, waste water disposal, dietetics, livestock housing, bedding and manure, protection of animals during transportation, general care and management of livestock, disinfection, parasite and pest control, and carcass disposal.

General principles of universal application are of course included in the book, but all special matters refer to German conditions of climate, fodder crops, dietetics, building material, and so on.

The least satisfactory section is perhaps that on buildings, as the figures are scanty and the text only touches on generalities without specifying many kinds of buildings for all the classes of farm animals.

As a whole this is a good handbook and gives the relevant information in a systematic manner and there is a satisfactory index. Incidentally, with this book the veterinary student of German can widen his vocabulary in names of fodder plants, poisonous plants, parasites, etc., as these are usually given in German and Latin.

The German legislation on carcass disposal is quoted in some detail, along with the technicalities, and this might be used as a guide for what is required in this country.—J. E.

TWOMBLY, G. H., & PACK, G. T. [Edited by]. (1947.) **Endocrinology of neoplastic diseases.** pp. vi + 392. London: Oxford University Press. 70s. 1412

A series of articles which appeared in *Surgery* in 1944 as a symposium on the endocrinology of neoplastic diseases has been revised and brought up to 1946 and is now published in book form. The articles, based on the experience of the various authors as well as on critical reviews of the literature, deal with such subjects as the effects of hormones in producing neoplasms, the syndromes caused by tumours of the endocrine glands, and the use of hormones in the treatment of cancer. There are useful and usually lengthy lists of references at the end of each chapter. The subject matter is treated from the standpoint of disease in man, but the articles in general, and chapters 4, 6, 8, 10 and 12 in particular, will nevertheless be of general interest to the veterinary worker.

The scope of the book is indicated by the chapter headings: Introduction (Twombly, G. H., & Pack, G. T.) (this contains a tabulated list of hormones produced by endocrine glands, and the names of commercial preparations); (1) Tumours in experimental animals receiving steroid hormones

(Gardner, W. U.); (2) Experimental investigations concerning the role of the pituitary gland in tumorigenesis (Selye, H.) (this deals with the effect of deficiency or excess of pituitary hormones on tumour formation, and the morphological changes in the anterior lobe elicited by experimental tumours); (3) The endocrine effects of pituitary tumours (German, W. J.); (4) Ovarian tumours with sex hormone function (Novak, E.); (5) Endocrine factors in the origin of tumours of the uterus (Taylor, H. C.); (6) The relationship of hormones to diseases of the breast (Nathanson, I. T.); (7) The effect of sex hormones on skeletal metastases from breast cancer (Farrow, J. H.) (deals with the effects of withdrawal or addition of oestrogens or androgens); (8) Benign hypertrophy and carcinoma of the prostate (Moore, R. A.). The evidence that benign hypertrophy and carcinoma of the human prostate are endocrinological dystrophies is discussed. The conditions have not been produced in experimental animals in a form similar to that occurring in man. The author's opinion is that there is no evidence that the so-called "benign hypertrophy" in the dog is the same condition as occurs in man, but it is possible that the causal factors are the same in man and in the dog, the response on the part of the prostatic tissues however being different—in the dog, diffuse hyperplasia and, in man, nodular hyperplasia; (9) The endocrine treatment of cancers of the prostate gland (Dean, A. L., Woodward, H. Q., & Twombly, G. H.) (discusses the effects of castration and stilboestrol treatment); (10) The relationship of hormones to testicular tumours (Twombly, G. H.). There is considerable discussion of the occurrence and significance of the urinary excretion of hormones in these cases in man; (11) Adrenal cortical tumours—physiologic considerations (Kenyon, A. T.); (12) Hormonal tumours of the adrenal (Cahill, G. F.); (13) Endocrine activity of thyroid tumours and influence of the thyroid hormone on tumours in general (Lerman, J.); (14) Endocrine aspects of enlargements of the parathyroid glands (Cope, O.); (15) Hyperinsulinism in relation to pancreatic tumours (Whipple, A. O.); (16) The endocrinologic aspects of tumours of the pineal gland (Davidoff, L. M.).—E. COTCHIN.

WILLIS, R. A. (1948.) **Pathology of tumours.** pp. xxiii + 992. London: Butterworth & Co. 63s. 1413

This is an important new book, based on the results of extensive personal studies and wide and critical reading, by the author of "The Spread of Tumours in the Human Body". It is directed primarily to medical pathologists and research workers, but it can be recommended to all veterinary workers interested in the pathology of tumours.

There are many references to tumours in domestic animals, and the histology of some examples of these is illustrated. The book may suggest many profitable lines of research to the veterinary pathologist.

There are 500 figures, nearly all of them photomicrographs; these, which are from the author's own material, are of a high standard, and have in many cases been chosen to illustrate less familiar histological features or rarer kinds of tumour, and they may serve to indicate a possible diagnosis to the veterinary pathologist presented with an unusual tumour. One very useful feature of the book is the provision at the ends of the chapters of lists of references (works consulted, with very few exceptions, by the author himself), the more important papers being shown in bold type, often with a short comment on their special value. Thus the book, which is very well produced, will serve not only as a lucidly-written and informative text-book, but also as a critical and stimulating introduction to further reading.

The work is in two parts. In the first, of 12 chapters, there is a general account of the pathology of tumours, while particular tumours are dealt with in the 50 chapters of part 2. In chapter 1, "Definition of tumour", the defects of some extant definitions are noted, and a definition is given which stresses the uncoordinated and persistent nature of the growth of tumours which distinguishes them from other proliferative lesions, whether hyperplasias, reparative or inflammatory proliferations, or malformations with excess of tissue:—"A tumour is an abnormal mass of tissue, the growth of which exceeds and is uncoordinated with that of the normal tissues, and persists in the same excessive manner after cessation of the stimuli which evoked the change". Chapter 2 is concerned with classification and nomenclature. The author groups tumours under the following heads: Tumours of epithelial tissues; of non-haemopoietic mesenchymal tissues; of haemopoietic tissues; of neural tissues; sundry special classes—melanoma, chordoma, embryonic tumours of viscera (including nephroblastoma), teratoma, and chorion-epithelioma. The defects of Adami's scheme are indicated. It is suggested that the names of truly compound tumours should be formed with a hyphen between the parts of the name indicating each neoplastic component, *e.g.*, fibro-adenoma, while the hyphen should be omitted when compound descriptive names are formed merely by adding adjectival prefixes, *e.g.*, fibrosarcoma, adenocarcinoma. In chapter 3, on innocence and malignancy, the point is made that there is no fundamental clear-cut distinction between innocent and malignant tumours. While the degree of malignancy in

general is broadly paralleled by the degree of anaplasia, in certain tumours a high degree of organization is quite compatible with malignancy, and, conversely, poor organization with innocence. Chapter 4 deals with experimental carcinogenesis, and chapter 5 with the statistical study of tumours. In chapter 6 there is a general account of tumours in animals, including domestic animals, particular kinds of tumours being dealt with in the relevant chapters of part 2. The author points out that much may yet be learnt from a comparative study of animal tumours that may throw light on the human disease; for example, obscure questions of histogenesis might be elucidated and a survey of the incidence of particular tumours might suggest possible responsible carcinogenic factors. Other points worth investigating in respect of particular animal tumours are mentioned in part 2. A table is given in this chapter showing the types of tumour present in 204 cases in dogs which were examined by Rudduck and the author.

In chapter 7, on the mode of origin of tumours, the author shows how tumours arise, not from single minute unicentric, perhaps unicellular, foci, but from small or large fields of tissue, and enlarge, in the early stages at any rate, not only by cellular proliferation, but also by progressive neoplastic conversion within these fields of origin, a point of surgical importance being that the potentially neoplastic field may extend much further than the size of the initial tumour might suggest.

The remainder of part 1 deals with the structure, growth, and spread of tumours in the body, and with hypotheses as to the nature of neoplasia, chapter 12 being one of recapitulation. In part 2, comprising nearly 800 pages, particular kinds of tumour are dealt with according to the author's scheme of classification. Many debatable points are discussed at length in the appropriate places. One chapter of particular interest is devoted to teratomas. The references to animal tumours in this part of the book are based partly on the literature and partly on the author's own studies.—E. COTCHIN.

BACHARACH, A. L. [M.A. (Cantab), F.R.I.C.].
(1947.) *Science and nutrition*. pp. xii + 142.
London: Watts & Co. 3rd Edit. 6s. 1414

In this book which has retained its popularity through three editions, the author gives an account of the present position of nutritional science which will be readily understood by the layman. In so doing, the use of animal experiment, the metabolism of the major food constituents, the minerals and the vitamins are dealt with in outline and in conclusion the relationship between diet and health is considered.

Whilst the subject matter is perhaps dealt

with in too slight a manner for the serious student, nevertheless the book is eminently readable and may be recommended as an introduction to the subject of nutrition.—J. A. NICHOLSON.

COOPER, E. R. A. [M.D., M.Sc.; Reader in Histology, University of Manchester]. (1948.) **Human histology. A guide for medical students.** pp. xii + 431. London: H. K. Lewis & Co., Ltd. 2nd Edit. 8vo. 27s. 6d. 1415

This inexpensive text-book, which gives a straightforward account of human histology, is designed for the use of medical students. Chapters are devoted to the microscope; the cell and cell-division, in which the account of the cell is rather brief; epithelial, muscular, connective and nervous tissues; the blood; the vascular and lymphatic systems; the endocrine organs; the respiratory, digestive, urinary, genital, and nervous systems; and the organs of special sense. The final chapter, as an introduction to embryology, deals with four structures related to the embryo and foetus—the mammary gland, chorionic villi, placenta, and umbilical cord.

The book would probably meet many of the requirements of the veterinary student during his histology course, and would be of particular help when sections are being examined. The majority of the illustrations are photomicrographs made largely from human material, and descriptions are given of sections and other material to be examined in practical classes; the photomicrographs themselves are often at a quite low magnification, and show clearly the lay-out of tissues in the different structures of the body. Some tissues of the cat are included, as well as the ligamentum nuchae of the ox.

There are four coloured plates, and 257 illustrations in the text. The author explains that the almost complete absence of drawings, at first sight rather surprising, is intentional, teachers being relied on to supplement their lectures with sketches and projections of slides. The photomicrographs given are indeed a striking feature of the book, but carefully prepared drawings, published in permanent form in a text-book, are very helpful to students, bringing out features which cannot be shown adequately in photomicrographs or described easily in words. As compared with the first edition, the chapter on blood, marrow and haemopoiesis has been re-written, and a diagram of the nephron included.

The following words were noticed to be misspelt or misprinted: ileocaecal (under fig. 155); stomodaeum (index); fuscine (p. 362, and index);

See also *absts.* 1392 (principles and methods of animal breeding); 1403 (Spanish-English dictionary).

Disse (p. 237, under fig. 162, and index); "Blind spot" (p. 364) is wrongly indexed.—E. COTCHIN.

ROSEVEARE, G. M. (1948.) **The grasslands of Latin America.** pp. 291. 15 figs. 9 plates. 4 tables. Numerous refs. Aberystwyth: Imperial Bureau of Pastures and Field Crops. 20s. 1416

This work is a very exhaustive summary of the published information on the grasslands of South and Central America. About half the book is devoted to descriptions of the natural grasslands: the remainder to such subjects as temporary leys, browse and poisonous plants, soil-erosion, management of grasslands and research. The bibliography covers 31 pages of small type and there are author and species indexes.

The amount of information available on the botanical composition of the different grassland areas varies. On some there is very little and that, occasionally, somewhat contradictory: on others, for example, the semi-arid grazings of North-Eastern Brazil, there is sufficient for a vivid picture to be drawn. The collation of so much material has obviously been a lengthy task and this section of the work will prove of value to students of grassland vegetation. The descriptions of the beef-producing areas of the Argentine and Uruguay will appeal to many who are interested in stock-husbandry.

Much of the remainder of the book could have been covered by expanding slightly the appropriate portions of the descriptive chapters. Some of the information given, being general knowledge, could have been omitted and there is a certain amount of repetition. The short section on Animal Health is hardly relevant to the subject and contains a number of opinions that will astonish veterinarians. One reads, for example, that hypocalcaemia in cattle and sheep is "characteristic of lime-deficient grazings".

The subject of grass-burning could have been treated more scientifically. By grouping the opinions of those who favour and those who are against grass-burning, the author may help to prolong the old controversy. A better approach would have been to have mentioned the areas in which controlled burning is considered to be of benefit and those in which it is likely to do harm.

The author's English is sometimes a little difficult to follow and the penultimate paragraph on page 122 is unintelligible. Since the book is in English, it is surely a mistake to express temperatures "according to Celsius". The printing, paper and binding are good.—J. R. H.

INDEX VETERINARIUS

The publication of *Index Veterinarius* commenced with the indexing of the literature of 1933. It is a complete index of current publications relating to veterinary research, public health, administration, education and other aspects of veterinary science.

The latest list of the publications searched for this purpose was included in *Index Veterinarius*, Vol. 6, No. 1 (issued December, 1938) and also circulated with the *Veterinary Bulletin*, Vol. 9, No. 1.

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